THE POLAR TIMES

The Polar Times

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Stefansson Receives Honor By American Polar Society

NEW YORK, Feb. 5—Dr. Vilhjalmur Stefansson, veteran Arctic explorer and author has been unanimously voted in as the third Honorary Member of the American Polar Society by its executive board. He was presented with an illuminated scroll emblematic of the honor and containing a map of the areas he has explored, in a meeting held here tonight at Roosevelt Memorial Hall, the American Museum of Natural History.

In the absence of the Society's President, Dr. Paul A. Siple of Erie, Pa., now at Little America, Russell J. Walrath of Westfield, N. J., Vice-President presided.

Earl P. Hanson of Rhinebeck, N. Y., who explored in Iceland in 1927 and in the Canadian Arctic in 1929, presented the scroll to Dr. Stefansson. The Society's first Honorary Membership was conferred upon Brig. Gen. David L. Brainard, U. S. A. (Ret) of Washington, D. C., Dec. 21, 1936. He is the last survivor of the Greely Arctic Expedition of 1881-84. The second went to Rear Admiral Richard E. Byrd at his Boston home, Oct. 25, 1938.

Stefansson Says Arctic Regions Offer Way to Peace Among Nations

SPARTANBURG, S. C. — The only real hope for future world peace lies in the frozen fastnesses of the Far North, in the opinion of Vilhjalmur Stefansson, Arctic explorer, who lectured at Wofford College on the vital possibilities of the great Northern areas in fostering and facilitating a return to normal conditions in a disrupted world.

With the principal countries of the globe fighting for "living space," declared Mr. Stefansson, the Arctic and the sub-Arctic offer vast unexploited natural resources in localities which have been found easily habitable by white men.

The common theory, the explorer said, that the Arctic is an extensive ice-bound territory, unfit for habitation by human beings from civilized countries, is entirely false.

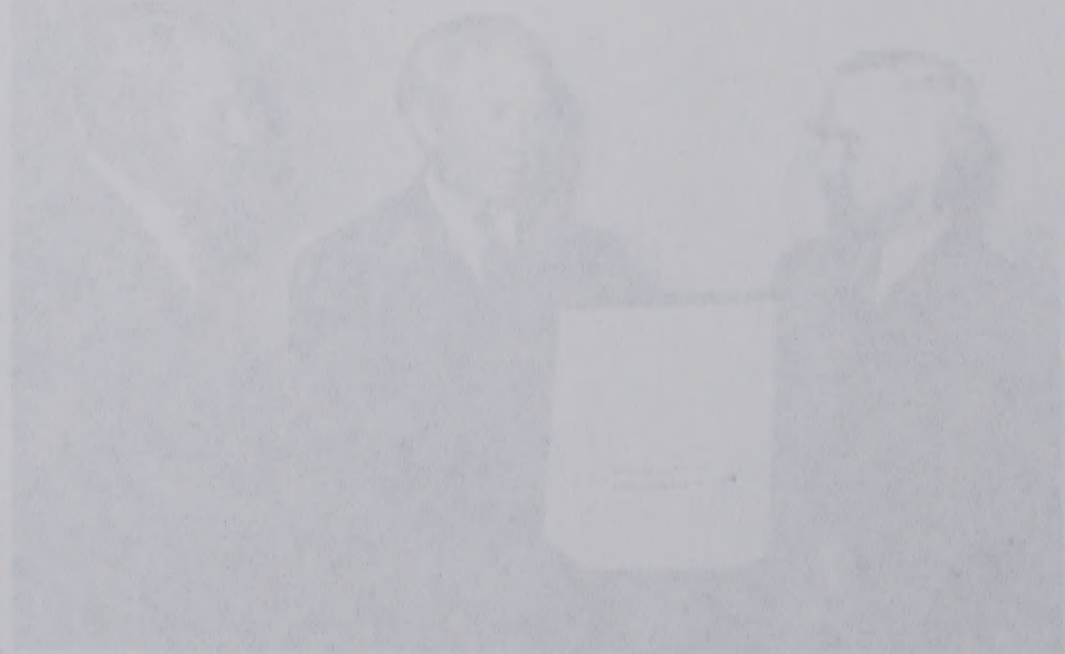
Just the reverse is true, if anything. There are large reaches of arable land, abundant in mineral resources and timber, which have not yet been settled or even explored by white men. As examples of nations that have profited by their exploitation and sub-Arctic resources, Mr. Stefansson cited Finland and Russia, where enormous strides have been taken in the conquest of hitherto unexplored and unsettled lands.

That certain areas of the Arctic possess living resources has been demonstrated time and again by Mr. Stefansson and his parties, who lived off the land and by foraging for long periods of time. equipped only with instruments for exploring and charting and depending entirely on the country itself for foodstuffs.

Although he and his men subsisted almost wholly on meat, they found their diet satisfactory for all their needs.

Mr. Stefansson's career as an explorer and map-maker are well known and highly significant. He has surveyed extensive areas in the Canadian Arctic which were previously unknown; he has contributed three new islands to the maps of the Arctic lands; he has charted unknown seas; and he was the first to explore the Horton River, a stream similar in dimensions to the Hudson River. His experiences and discoveries have provided material for 12 books, numerous magazine and newspaper articles and countless lectures during the past 25 years.

EARL P. HANSON DR. VILHJALMUR STEFANSSON RUSSELL J. WALRATH



SECRET ORDERS TAKEN BY BYRD ON POLAR TRIP

Confidential White House Instructions Given Before Start

WASHINGTON, Nov. 29 (AP)—Rear Admiral Richard E. Byrd joined the vanguard of his South Pole expedition, at the Panama Canal today with confidential orders from the White House. Officials said the orders were a State Department secret and, they believed, concerned recommendations to be made to Congress in regard to prospective American territorial claims in the Antarctic.

Even the existence of the orders, authorities said, had been kept secret, probably because of the tense situation the European war has drawn around British, French, German, Norwegian and Argentine claims to South Polar areas. Admiral Byrd received them, informants said, on a hurried trip to Washington last week just before departing for Panama.

By The United Press.

WASHINGTON, March 4—President Roosevelt clamped a censorship on the Byrd Antarctic Expedition to keep secret, until the proper time, any United States territorial claim which it may make in the South Polar regions, it was disclosed today.

Before the expedition's departure, Mr. Roosevelt wrote Rear Admiral Byrd as follows:

"The United States has never recognized any claims to sovereignty over territory in the Antarctic regions asserted by any foreign state. No member of the United States Autarctic Service shall take any action or make any statements tending to compromise this position.

"Members of the service may take any appropriate steps such as dropping written claims from airplanes, depositing such writings in cairns, etc., which might assist in supporting a sovereignty claim by the United States Government.

"Careful record shall be kept of the circumstances surrounding such act. No public announcement of such act shall, however, be made without specific authority in each case from the Secretary of State."

The President also specified that the diaries an djournals of the men must be surrendered and sealed "before they reach the first port north of the Antarctic region." The men also were enjoined from writing or speaking of the exploration work.

PANAMA, R. P., Nov. 28—Rear Admiral Richard E. Byrd arrived at Cristobal, C. Z., on the liner Amapala today on his way to the Antarctic and came to Panama by train at noon on expedition business.

BALBOA, C. Z., Nov. 29 (UP)—Rear Admiral Richard E. Byrd's polar ship, the North Star, arrived here today after passing through the Panama Canal from Cristobal on the Atlantic side.

BALBOA, C. Z., Nov. 30—Rear Admiral Richard E. Byrd sailed today aboard the North Star, his flagship, on his third expedition to Antarctica.

The ship, piled helter-skelter with gear and supplies and with yelping huskies tied to every available post, left the pier at Balboa where she had been loaded with bamboo for marking Antarctic snow trails.

PANAMA, Dec. 6—The supply ship of Admiral Richard E. Byrd's third Antarctic voyage, the Bear, sixty-five-year-old veteran of the polar ice packs, sailed at 3 o'clock this morning for Dunedin, N. Z., to join the North Star, which left Balboa, C. Z., Nov. 30.

The Bear completed the transit of the Canal last night after refueling at the naval submarine base at Coco Solo.

The Bear was built as a whaler at Greenock, Scotland, of good solid oak. She was first purchased by the United States Government to break through the ice to rescue six of the Greely expedition at Cape Sabine in 1884 after attempts in 1882 and 1883 had failed.

Personnel of Winter Parties at Both Bases

The following 33 men comprise the Winter Party at the West Base established on the Bay of Whales, located about 4 miles northeast of Little America:

Dr. Paul A. Siple *Base Leader*
Lt. Com. I. Schlossbach *Ex. Officer*
Dr. R. G. Frazier *Medical Officer*
Vernon D. Boyd *Master Machinist*
James C. McCoy *Aviation Pilot*
Harold P. Gilmour *Recorder*
Clay W. Bailey *Communications*
Adam Asman *Tractor Driver*
Leonard M. Berlin *Surveyor*
Jack Bursey *Dog Driver*
Raymond A. Butler *Cartographer*
Louis Colombo *Supplies*
Arnold Court *Meteorologist*
Malcolm C. Douglass *Dog Driver*
Roy G. Fitzsimmons *Physicist*
Walter R. Giles *Aviation Pilot*
Orville Gray *Plane Mechanic*
Sigmund Gutenko *Cook*
Dr. Ernest Lockhart *Physiologist*
Richard S. Moulton *Dog Driver*
Raymond D. O'Connor *Carpenter*
Charles F. Passel *Geologist*
Jack E. Perkins *Biologist*
Jerry A. Reece *Radio*
Harrison H. Richardson *Dog Driver*
Charles C. Shirley *Photographer*
Lawrence A. Warner *Geologist*
Loren Wells *Sailmaker*
Murray Weiner *Physicist*

The Snow Cruiser is manned by the following personnel:

Dr. F. Alton Wade *Senior Scientist*
Felix L. Ferranto *Radio*
Clyde W. Griffith *Engineer*
Theo. A. Petras *Aviation Pilot*

The following 26 men comprise the Winter Party at the East Base established on the shore of Marguerite Bay, Palmer Land, at approximately 68° 10½' S, 67° W:

Richard B. Black *Base Leader*
Lt. L. S. Sims *Medical Officer*
Ashley C. Snow *Ch. Aviation Pilot*
Elmer L. Lamplugh *Ch. Radio Op.*
Anthony Morency *Tractor Driver*
J. Glenn Dyer *Surveyor*
Hendrik Dolleman *Dog Driver*
Paul H. Knowles *Geologist*
Robert Palmer *Supplies*
Herbert G. Dorsey *Meteorologist*
Joseph A. Healey *Dog Driver*
Earl B. Perce *Assistant Pilot*
Archie C. Hill *Cook*
Charles Sharbonneau *Carpenter*
Herwil M. Bryant *Biologist*
Howard T. Odom *Radio Operator*
Arthur J. Carroll *Photographer*
Lester Lehrke *Sailmaker*
Zadick Collier *Chief Mechanic*
Harry Darlington *General Service*
Carl R. Eklund *Asst. Biologist*
Donald C. Hilton *Asst. Surveyor*
Lytton Musselman *General Duty*
Wm. A. Pullen *Aviation Mechanic*
Finn Ronne *Transportation Eng.*
Clarence E. Steele *Tank Driver*

New Zealand

Messrs. Roy Fitzsimmons (with wreath) and Murray Weiner, two physicists on the scientific staff of the Byrd Antarctic Expedition, laying a wreath on the statue of Captain Robert Falcon Scott, in Christchurch, as a tribute from the people of the United States to the memory of the great Antarctic explorer.

BYRD STARTS RETURN FROM THE ANTARCTIC

Sails in Accordance With Plans, Leaving Two Winter Bases

WASHINGTON, March 23 (AP)—Rear Admiral Richard E. Byrd, leader of the government's Antarctic Expedition, is on his way back to the United States after establishing two Winter bases in the Antarctic.

Expedition headquarters received word today that Admiral Byrd was aboard the flagship Bear, which sailed with the supply ship North Star from the east base south of Cape Horn. His return was in accord with plans announced before the two vessels left for the Antarctic last Fall.

The ships are headed for Punta Arenas, Chile. Thence they are scheduled to go to Valparaiso, arriving about April 1. The Bear is to sail for an Atlantic coast port through the Panama Canal, while the North Star will go to Seattle to prepare for its customary Summer trip to Alaska for the Interior Department.

Whether Admiral Byrd will return to the Antarctic next Fall will be decided after his arrival home, officials indicated.

BYRD ENCOUNTERS STORM

Admiral, in Chile, Tells of 50-Foot Waves Off Cape Horn

PUNTA ARENAS, Chile, March 31 (UP)—Rear Admiral Richard E. Byrd revealed today that the steamer Bear, returning him and members of his expedition to the United States from the Antarctic, had been battered by waves 50 feet high as it plowed northward from "Little America."

The pounding the vessel took will necessitate a stopover of at least three days in this port for repairs to the vessel's gear, the admiral said.

Admiral Byrd is returning home after 2½ months in Antarctica. He said that the northward journey had been made without incident until the storm struck suddenly 200 miles off Cape Horn.

The North Star, supply ship of the government-sponsored expedition, put into Valparaiso harbor yesterday. The two ships left the Antarctic together.

Admiral Byrd said that thirty-three members of the expedition are still at the main Antarctic base and that twenty- six others were at the east base in Palmerland. He added that the men would remain until he rejoined them next year to continue his studies.

Talks With Husband in Antarctic

By The Associated Press.

RICHMOND, Va., March 1—Airplane Pilot T. A. Petras, who is down near the South Pole with the Byrd expedition, wanted to speak to his wife, so he did.

Mrs. Petras, roused at 4 A. M., was somewhat surprised to find out that Antarctica was calling and her husband was on the line.

The 8,800-mile call resulted from the cooperation of R. S. Dawson Jr., amateur operator of Station W4DSY in Charlotte, N. C. Dawson made contact with the Byrd expedition during the evening, called Mrs. Petras by telephone and then connected the telephone to the radio.

BYRD WIRES STORY OF PITCAIRN PLIGHT

Relates How the North Star Gave Food and Medicine to War-Hit Islanders

WASHINGTON, Dec. 19—Rear Admiral Richard E. Byrd, commanding the Antarctic Service, has reported in detail the story of the plight of the inhabitants of Pitcairn Island, in the South Pacific, which the flagship North Star visited Dec. 13 and 14. Not only did the North Star leave food and medical supplies for the half-starved population, but it also was host at the first moving-picture show ever presented on the island.

The story of the plight of Pitcairn Island, as wirelessed to the Navy Department by Admiral Byrd, read as follows:

"Life is hard on Pitcairn Island. Even in normal times, the descendants of Fletcher Christian, Robert Mills, and other mutineers from H. M. S. Bounty, live frugally. But today, victims of a war one-third of a world away, they are reduced to barest necessities.

"Possibly more than any other community in the world, Little Adamstown is demonstrating how far the tentacles of war can reach. Word of food shortage and lack of medical supplies on tiny Pitcairn reached the outside world last week when the U. S. M. S. North Star, flagship of the United States Antarctic Service, fourteen days out of Balboa, Canal Zone, dropped anchor in Bounty Bay, unaware that she was to serve in effect as a relief ship.

"Aided by blinker signals from a cliff and her own searchlight, the vessel approached within half a mile off shore before Captain Isak Lystad brought her to anchor. She boarded immediately by hungry, poorly-clothed islanders bearing palm-leaf baskets, wood carvings, cocoanuts, papayas, avocadoes, woven hats, and birds' feathers which they offered in exchange for food and clothing. Chief Magistrate R. Edgar Christian, a direct descendant of mutineer leader Fletcher Christian, explained the islanders' plight.

"One of the first effects of the second world war, he said, had been disruption of shipping schedules from Wellington, N. Z. Vessels had virtually ceased stopping at Pitcairn, he stated, since last July, and none had visited the island since last Oct. 24. No ships means no processed foods, clothing, or medical supplies on Pitcairn, Christian explained, and when the island's signal bell clanged tidings of the North Star's approach at sundown Wednesday, the islanders were suffering from lack of many necessities.

"Medical and surgical cases, though few, had gone unattended for months. A substitute for flour was being made of ground coconut meat, maize, wild beans (lab-lab), arrow root, and flower petals. This mixture was beaten up with coconut milk and baked into soggy bread. Toasted coconut shreds were serving for coffee, sweetened with sugar from a hand-operated cane sugar press. Those islanders who used tobacco were reduced to smoking dried grass.

"Aside from the opportunity of obtaining medical attention and supplies, highlight of the Interior Department's vessel's visit for the islanders was a moving picture show in the main saloon. Biggest hits were scenes of New York City. Most of the islanders were seeing movies for the first time in their lives.

"In mid-afternoon Thursday a whistle blast recalled shore parties as the vessel slowly got under way. The islanders stood in their boats and, with tears of gratitude glistening on their cheeks, sang songs of farewell."

CHRISTMAS DINNER FOR AN ANTARCTIC EXPEDITION

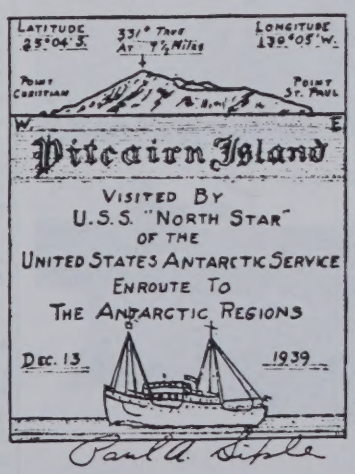
Members of Rear Admiral Richard E. Byrd's party shown aboard the motorship North Star en route to Little America. Left to right: Dr. Paul A. Siple, Admiral Byrd, Dr. F. Alton Wade, Chief Steward Sigfred Sundt (standing), J. L. Morency, commodore for a day; Finn Ronne (head only) and Roger Hawthorne.

Explorers' Mail Exhausts Pitcairn Stamps And Envelopes Arrive Unstamped

ADMIRAL RICHARD E. BYRD'S current expedition to the Antarctic provided 790 items for aspiring cover-collectors when the U. S. S. North Star put in at Pitcairn Island in the Pacific in December. Information reached New York last week that the crew exhausted Pitcairn's supply of New Zealand stamps; consequently, some of the covers mailed by the crew to friends in the United States have no stamps on them.

The covers without stamps were placed in a mail pouch at Pitcairn and sent to the San Francisco postmaster, who forwarded them in individual government envelopes to the addresses with a typewritten notation enclosed reading "Postage on this letter prepaid when mailed on Pitcairn Island." It is not known how many of the 790 covers were franked with New Zealand stamps before the supply ran out.

One of the covers without a stamp was received in New York by Russell Walrath, president-elect of the American Polar Society, and is autographed by Paul Siple, the society's president, who is a member of the Byrd Expedition. This cover bears a Pitcairn Island New Zealand Postal Agency postmark of Feb. 17 Dec. 14. It reached New York on Feb. 11 from San Francisco. The Siple autograph is under a cachet picturing Pitcairn, giving the island's latitude and longitude and its height, illustrating the Byrd ship, and bearing an inscription noting that the vessel visited Pitcairn on Dec. 13.



Cachet on covers mailed by Byrd expedition members while at Pitcairn Island.

Byrd's Crew Celebrates Non-Existent Christmas

Calendar Jumped Over Day at International Date Line

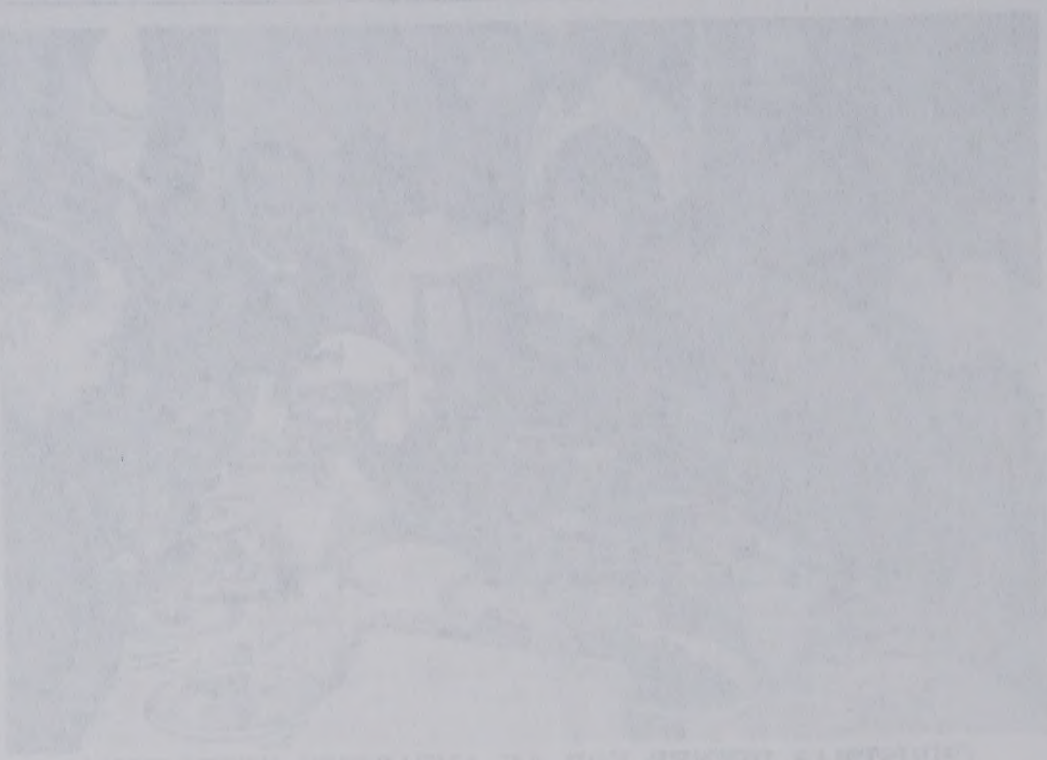
WASHINGTON, Dec. 26 (UP).—Rear Admiral Richard E. Byrd notified the Navy today that his Antarctic expedition "skipped" Christmas day when it crossed the international date line sailing westward across the Pacific. Byrd radioed that his men ate a five-course turkey dinner, sang, and had a Christmas tree despite the fact that the calendar jumped from Dec. 24 to Dec. 26.

The North Star is expected to reach Dunedin, New Zealand, Thursday. Earlier messages recounted that the North Star battled gales on Dec. 22 and 23. The wind reached a velocity of fifty miles an hour and waves rolled as high as 30 to 40 feet. The 27-ton snow cruiser was firmly lashed to the foreward well-deck and rode out the storm without damage, Byrd said.

Inhabitants of Rapa Island, a tiny French possession in the Pacific Ocean, had their first news of the war in Europe when the North Star, flagship of the Byrd Antarctic expedition, touched there on December 17

DUNEDIN, New Zealand, Dec. 27 (AP)—The North Star, flagship of Admiral Richard E. Byrd's Antarctic expedition, arrived at Wellington today

WELLINGTON, Dec. 31 (Havas).—Rear Admiral Richard E. Byrd left here yesterday aboard his motorship North Star for Dunedin, from where he will sail for the Antarctic. The American explorer said he was "almost staggered" by the warmth of his reception in New Zealand.



Byrd Unloads at Bay of Whales, Men Capture Rare Sea Leopard

WASHINGTON, Jan. 12—Rear Admiral Richard E. Byrd, commanding the United States Antarctic expedition, notified the Navy Department that he and nearly seventy-five men have arrived at Kainan Bay

The radio message said that the group arrived about 8 A. M. today.

Admiral Byrd and the North Star put into the Bay of Whales early this morning only to find the usually accessible harbor filled with ice. Lack of substantial ice packs on which to unload the snow cruiser forced the vessel to proceed to Okuma Bay.

While skirting the edge of the Antarctic continent, Byrd reported, he came upon two newly formed bays which apparently had formed since the region was last mapped in 1934. These two bays also were filled with ice.

WASHINGTON, Jan. 16.—The Navy Department announced tonight that it had received word from Rear Admiral Richard E. Byrd that the United States Antarctic Expedition had reached the Bay of Whales and that the work of unloading the cargoes from the expedition's ships was under way.

The report received from Admiral Byrd was as follows:

"Forty-five members of the U. S. Antarctic Service and the crew of the U. S. motorship North Star today began the arduous task of unloading ship and establishing a base camp east of Little America. Every man aboard the expedition vessel participated in the unloading operations. Twelve-hour shifts mean hauling heavily laden tractor sledges, driving dog teams, burying 'dead men,' or ice anchors, and working at the thousand-odd muscle-straining jobs connected with unloading ship.

"Happiest member of the expedition was Zoologist Malcolm Davis, of Washington, at the capture of a gigantic sea leopard, extremely rare type of spotted seal. The specimen, about ten feet long and weighing approximately 800 pounds, was captured alive on a near-by pressure ridge by three members of the North Star's crew, Dr. Alfred Geyer, medical officer; Leo Bells and William Leroux, oilers. The animal, vicious and powerful, was subdued with difficulty. If it survives it will be delivered by Davis to National Zoological Park in the nation's capital.

"Another newsworthy achievement was the dropping of a sediment grapple 2,200 feet to the bottom of the Bay of Whales by Milton J. Lobell, of the Bureau of Fisheries. The cast brought a rare serpent starfish to the surface.

"A landing place apparently suitable for unloading operations was found on the east side of the bay, only after the North Star skirted along Ross Barrier approximately seventy-five miles eastward without finding safe harborage. The chosen spot offered a large flat area at the foot of the barrier, but necessitated a laborious hauling up the barrier slope to high safe ice. The snow cruiser's monoplane was landed first and hauled to a place of safety before a stream of miscellaneous equipment was started ashore. A 1,000-foot hawser was then stretched to the barrier's edge and fastened to a tackle, to take advantage of the vessel's powerful winches to expedite further unloading. Efforts were made to reach the expedition's tractors deep in the forward hold.

"Skiing in from a reconnoitering trip to Eleanor Bolling Bight, Drs. Thomas C. Poulter, Paul A. Siple and F. Alton Wade reported finding two large sawhorses used in 1935 at the departure of the second Byrd expedition. The find raised expedition hopes of subsequently finding buildings at Little America, intact."

HOMING TRAIT FOUND IN ANTARCTIC WHALES

Migration Studied by Chart of Tagging and Capture Areas

Whales in the Antarctic have a very strongly developed "homing instinct," it has been discovered from recent tagging experiments carried on by the Discovery Committee of Great Britain, Science Service reports.

Putting identification marks on whales is accomplished by firing into the whale a stainless steel tube from a 12-bore gun. The tube penetrates into the whale's blubber and is embedded there until the whale is captured and dismembered by whalers.

By keeping an accurate chart of the tagging locations and capture locations the migrations can be studied. It has been found, reports George W. Rayner in Nature, that whales tend to return to Antarctic water over regular tracks of migration and may be said to have a strong homing instinct.

On the other hand, they also seem to spread out around the Antarctic from one region to another. It is suggested that the whales gradually circumnavigate the Antarctic continent, but that it takes more than a generation of time to accomplish this travel.

Out of more than 5,200 whales which have been marked, some 187 have been recovered, which is roughly indicative of the percentage of marked whales killed.

Telephone Number From Antarctica

CHICAGO, Jan. 24 (A. P.).—Hubert Rieck Jr., a radio amateur of Lombard, communicated 10,000 miles rather than reach for a telephone directory.

An operator aboard the United States Antarctic expedition's snow cruiser asked Rieck last night to telephone Harold Vagtborg, of the Armour Research Foundation, designer and builder of the cruiser.

"Know his number" asked Rieck.

"It's Beverly 0995," said the polar operator, after a pause.

Dr. Thomas Poulter, snow cruiser pilot, wanted to tell Vagtborg of the progress on the final assembling of the machine.

Byrd Has 200-year Calendar.

BOSTON, Nov. 29 (A. P.).—It was disclosed today that when the United States Government's antarctic expedition was ready to depart from Boston last week Admiral Byrd discovered there were no calendars among the supplies. One was obtained. It's good for 200 years—just in case.

GRINDING ICE MASSES THREATEN BYRD SHIPS

Crews Save Vessels by Flight to Open Water in Bay

WASHINGTON, Jan. 22 (UP)—Rear Admiral Richard E. Byrd radioed the navy today that grinding ice masses in the Bay of Whales almost brought disaster to the United States Antarctic expedition, but prompt action by the crew prevented serious damage.

The expedition's ships, the Bear and the North Star, were being unloaded in the Bay of Whales on Jan. 17 when enormous chunks of ice broke up over an eight-mile front and threatened to smash the ships. For a time six members of the expedition were trapped on an

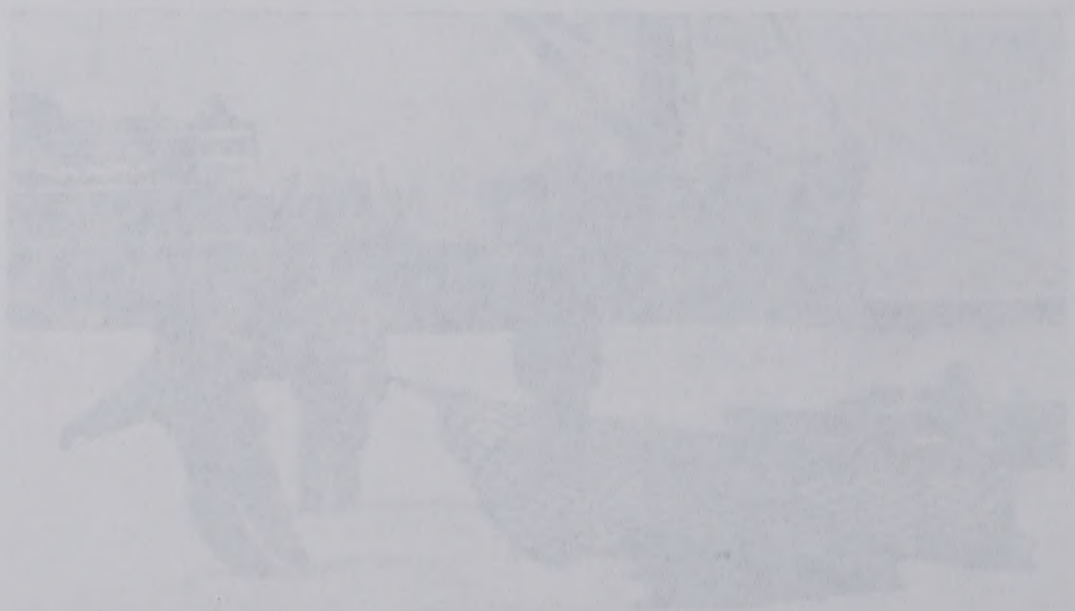
Members of the crew, working feverishly, cut loose the mooring lines fixing the ships to the ice. Then they managed to steer to safety in the open water. The result was temporary suspension of the unloading oprations and the jamming of the Bear's rudder.

In another dispatch Admiral Byrd reported that he and three other members of the party, Lieutenant George J. Dufek, of the navy; Ashley Snow, naval aviation pilot, and E. B. Perce, navy radio man, had made a 45-minute flight over his old base in 1935 in Little America. The buildings there apparently were intact.

He reported a cluster of half buried radio masts and poles showing above the surface with the indication that the buildings and equipment left behind in 1935 were safe beneath the icy covering.

The flight was taken as part of a search for a suitable western base for the new expedition. Admiral Byrd said that upheavals in the ice barrier apparently had changed the topography in the vicinity of Little America. One change, he said, was the elimination of part of the bowl-like landing field used in 1935.

This seal, caught with a fishing net, may be sent to an American zoo or aquarium.



Short-Wave Gives Antarctic Expedition U. S. Radio Programs

The latest developments in radio will enable members of another American expedition to the Antarctic to keep in touch with their families and to hear popular entertainment programs arranged by newspapers throughout the country

General Electric's powerful short-wave transmitter, WGEO, at Schenectady, will send the programs to Rear Admiral Richard Byrd and his men, and the programs at the same time will be broadcast throughout the United States on the Red network of the National Broadcasting Co.

The "mailbag" service was provided to members of two previous expeditions led by Admiral Byrd, and was the explorers' only means of communication with friends and relatives at home while icelocked in the Far South.

The "mailbag" service already has delivered between 150 and 250 letters to the men on the present expedition's ships North Star and Bear. After the expedition establishes bases in the Antarctic around February 1, it is planned to have relatives of some of the men come to Schenectady and talk personally with them.

The big short-wave transmitter, WGEO, formerly known as W2XAF, came through better than any other sending station on the two previous expeditions, it was said. Every program was received on the first expedition, and only two were missed on the second—these on nights when the aurora was particularly active and brilliant.

Since that time the power of the transmitter has been increased from 40 to 100 kilowatts. The station is still equipped with the directional antenna designed by Dr. E. F. W. Alexanderson, a G. E. radio expert. It is said to increase the signal volume in one direction about 10 times.

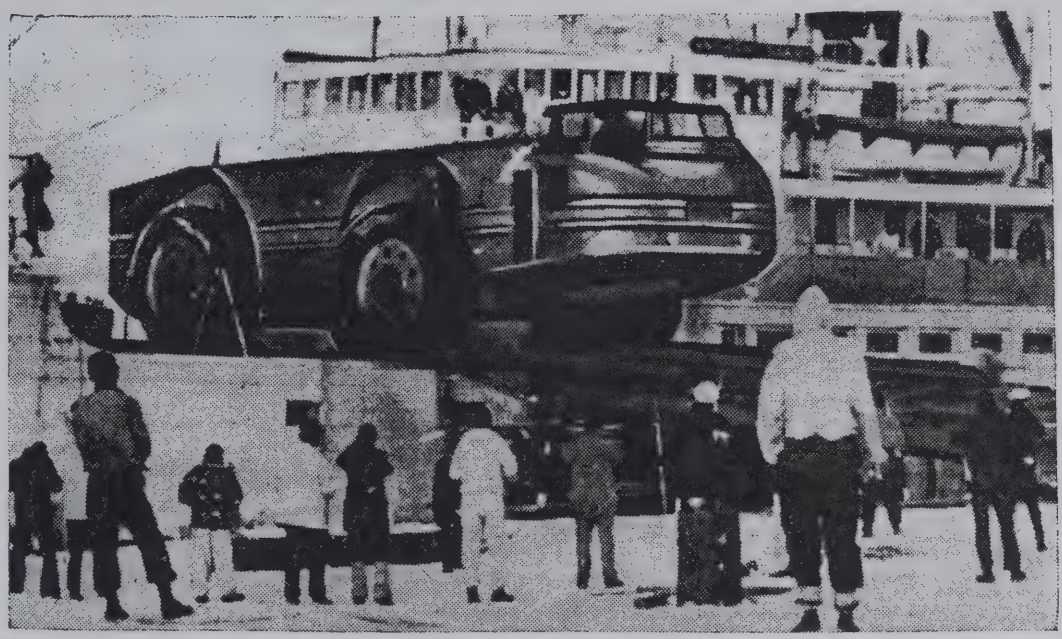
The expedition's two ships have been equipped with special receivers to pick up short-wave as well as popular broadcast programs. A receiver will be installed at each of the expedition's two bases.

BYRD ON THE DIAL

AGAIN the Byrd Antarctic Expedition becomes one of the world's long-range radio goals. The broadcasts may be picked up at a number of different spots on the dial since the transmitters are licensed to operate on all mobile ship wave-bands, special frequencies and call letters for communication with the United States Navy Department, and on several amateur channels.

The call of the West Base is KRTK and its call on amateur channels is KC4USA; East Base, KRTC, amateur, KC4USB; and the snow cruiser KRTA, amateur KC4USC.

The stations' licensed waves are: 6,425, 9,135, 11,060, 12,862, 23,100 and 30,660 kilocycles. The amateur channels are: 7,075, 14,150, 14,350 and 28,300 kilocycles.



The snow cruiser just before it rolled off the flagship North Star. The big machine demolished the ramp and skidded as it hit the ice.

Snow Cruiser Barely Misses Disaster in Unloading at Base

WASHINGTON, Jan. 18—A narrow escape from disaster in moving the Byrd Antarctic snow cruiser from the ship to the ice at the expedition's landing place in the Bay of Whales is recounted in a message from Rear Admiral Richard E. Byrd, commander of the expedition, made public here today by the executive committee of the United States Antarctic Service. The message, sent three days ago, was as follows:

"Amid a welter of flying splinters and broken planks, the gigantic snow cruiser lumbered safely ashore tonight from the Antarctic Service ship North Star. The cruiser, jocularly dubbed in the United States the 'Wheeled Dinosaur,' 'Penguin One,' and even 'Bouncing Betty,' kept on the move once all four of her ten-foot wheels reached treacherous bay ice alongside the ship.

"Remaining at the controls, Dr. Thomas C. Poulter of Chicago drove her a full mile from the ship before coming to a halt. Only quick action by Dr. Poulter saved the $150,000 machine from a catastrophe which might have resulted in serious injury to himself, Rear Admiral Byrd, and the snow cruiser crew.

"The mishap occurred just as the full weight of the cruiser bore down on a sixty-foot steel and wood ramp which had been raised to the level of the ship's rail. As the two front rubber doughnut-like wheels reached wooden timbers, comprising the lower two-thirds of the runway, there was a terrific splintering crash breaking through a dozen three by twelve inch supporting beams.

"The machine plunged to the ice with a sharp downward list to port nearly throwing Admiral Byrd, Dr. F. Alton Wade, Felix Ferranto and Theodore A. Petras from their perches atop the cruiser fifteen feet to the ice below. A fifth member of the crew, Claude Griffith, was at his engine room post deep inside the craft.

"Faced with almost certain disaster, Dr. Poulter did the only thing possible and, without hesitating, he applied full power. Throbbing and roaring, the cruiser swayed downward leaving a wake of splintered debris behind. Expedition members, who were anxiously watching the manoeuvre from the ice, cheered ecstatically. Admiral Byrd, who insisted on sharing the risk of the unloading, warmly congratulated Dr. Poulter, and commented later, "It had been an uncertain undertaking; its accomplishment takes a great load off our minds, as well as off the ship."

"Dr. Poulter modestly refused to take any credit, asserting that he acted on the advice of Ferranto to 'take your foot off the brake and gun her.'"

AUSTRALIA'S NEW MAP

The Departments of the Interior and External Affairs of the Commonwealth of Australia have just published a map of Antarctica, obtainable from the Secretary, Department of External Affairs, Canberra, A.C.T., Australia. The 2 sheet map, 60" by 40", sells for 7/6d and the 1 sheet map, 30" by 40", sells for 5/-d. A copy of the Handbook and Index, by E. P. Bayliss of the Department of the Interior and J. S. Cumpston of the Department of External Affairs, an excellent reference volume, is issued free with each copy of the map purchased.

Byrd Ahead of Schedule In Antarctic Exploration

WASHINGTON, Feb. 19 (AP)—A month's work in the Antarctic ice brought an official "well done" today for the Government's exploring expedition headed by Rear Admiral Richard E. Byrd.

Well ahead of their schedule, Admiral Byrd and his band of 120 natural scientists and adventurers received praise for having carried out already about half the program laid out for their first season "down under."

The men set up without major mishap one of two permanent bases for a stay that may extend into years, and air flights have filled in several large blank spaces on maps.

With the approaching onset of the long Antarctic winter, however, critical days are ahead

Admiral Byrd's announced hope is that the expedition will be maintained in the Antarctic from three to six years, investigating its unproven natural resources and making observations which would be vital should air lines hazard a short cut between the United States and Australia.

Men traveling by airplane and by dog sled must establish caches of food to be ready to resume exploration next October.

During the South Polar winter the two parties will be buried beneath snow in 20-by-20 pre-fabricated houses. They will rely on the radio for contacts with each and with the outside world.

Before winter comes, the expedition's 27-ton snow cruiser, which has been kept idle by soft snow, will be given a thorough trial in preparation for explorations late this year.

2 NEW POLAR PEAKS LOCATED BY BYRD

Admiral on Flight Discovers Mountains 300 Miles From His Antarctic Base

WASHINGTON, Jan. 26—The discovery of two new Antarctic mountain peaks has been reported, under date of Jan. 22, to the government by Rear Admiral Richard E. Byrd. The discovery was made, Admiral Byrd said, during a flight over unexplored coastlines 300 miles northeast of the Bay of Whales.

The message was as follows:

"Flying over unexplored coastline 300 miles east of the Bay of Whales, Rear Admiral Richard E. Byrd, U. S.N. (retired), today discovered new mountain peaks in the vicinity of Marie Byrd Land. The peaks apparently bordered the northern coast of the area which Admiral Byrd first discovered from the air in 1929. There were mirages and cloud shadows, but, on returning to the U. S. S. Bear, flagship of the United States Antarctic Expedition, after a three-hour flight, Admiral Byrd voiced confidence that his view of the new mountains constituted a first-class discovery. The flight also led to first realization that Sulzberger Bay was larger than previously charted and in effect an Antarctic sea. The flight also verified the presence of a large new bay a few miles east of Cape Colbeck.

"Because of continuous local climatic disturbances, which time and again upset his flight plans, the Admiral unofficially named the area 'The Bay of Gales.' The crew of the Barkeley Grow, a twin-motored seaplane, was comprised of the Admiral, serving as navigator; Aviation Chief Pilot Ashley Snow, U. S. N., and Earl B. Perce, radioman, first class, U. S. N., co-pilot and radio operator.

"One obstacle after another delayed the Admiral's take-off. Three times in as many days the plane was hoisted overside and loaded only to be taxied back to the ship. Yesterday a sudden change of weather in the 'Bay of Gales' approached gale force at times and made the plane's return to the ship through a heavy snow squall difficult and dangerous. Heavy seas breaking over her cabin froze everything and encrusted her pontoons with ice until they lay barely awash.

"Today, after six abortive attempts to get into the air, during which the roaring plane only reached a surface speed of seventy-two miles an hour, the Admiral ordered a rubber lifeboat and half of the emergency rations removed. In addition he was confronted with a peculiar wind which blew steadily at a 45 degree angle across the waves instead of with them.

"The resultant cross chop made taking off a risky manoeuvre. The situation was further complicated when the Admiral, taxiing far from the ship in search of normal conditions, was unable to determine the wind direction. This new problem was solved, however, by stopping the engines, climbing out on the plane wing and lighting cigarettes. The cigarette smoke served to indicate wind direction.

"Plane functioned perfectly throughout the flight and remained in constant communication with the U. S. S. Bear, using her signals on the return flight for radio compass bearings.

LITTLE AMERICA GETS CONDOR PLANE

BYRD FLIGHT ADDS TO ANTARCTIC MAP

Over 300 Miles of Coast East of Little America Charted in Day's Expedition

WASHINGTON, Jan. 30—Admiral Byrd announced in a report under date of Jan. 26, received today by United States Antarctic Service, that in a three-hour flight he had penetrated deep into unkown regions and had charted more than 300 miles of coast line east of Little America.

The flight enabled the explorer to verify his discovery of a new mountain range the previous day, and added to the map new mountain peaks, glaciers, nunataks, and a partly snow-covered island 200 or 300 feet high. One of the mountains stood 4,000 feet above snow levels, its summit just in the clouds.

Admiral Byrd considered it "the most productive flight, geographically speaking, that I have ever made."

The report said he took off at 12:34 P. M., local time, and a few minutes later the range of mountain peaks, which had been sighted briefly on Thursday, was clearly discernible. The range had dammed vast snowfields far inland, but here and there broad glaciers and majestic frozen waterfalls could be seen. Admiral Byrd had the plane swung eastward and followed the ridge for about 120 miles. Even then peaks could be seen extending seventy or eighty miles to the horizon to the southward. A lofty snow-covered mountain at least forty miles long reared about 4,000 feet above snowfields.

"With a suddenness characteristic of Antarctica, visibility faded rapidly and in a few minutes the Barkley Grow (twin-motored seaplane) was tossed about violently," the report continued. "Instead of turning back, the admiral ordered the plane pointed southeastward, and it was this change of course which led to one of the most interesting discoveries.

"Far below them, running north and south, the fliers made out the outlines of a rocky island separated from the mainland by a sheet of glittering shelf ice. Part of the island lay in open water but, with the exception of its northern end, where black rock jutted 200 or 300 feet above the waves, it was entirely covered with snow.

"Swinging in a long arc back toward the Bear (the flagship), Admiral Byrd estimated that his third and fourth flights combined have enabled him to chart accurately approximately 30,000 square miles of unknown territory."

Another report received by the executive committee said that the motor ship North Star has retired from the Ross Sea, having completed the unloading operations at the Bay of Whales. The ship's last position was reported as Lat. 67 degrees 4 minutes S., Long. 176 degrees 45 minutes E., where she is experiencing a strong easterly gale, with heavy seas. The North Star encountered frequent ice bergs on this northern voyage, but met little pack ice. She is now en route to Valparaiso, Chile, and expects to reach that port about Feb. 15.

BYRD SHIP REACHES NEW EASTERN POINT

He Charts Course by Plane for Trip of Bear Through Sulzberger Bay

WASHINGTON, Jan. 27—Penetration of Sulzberger Bay to its eastern shore by Rear Admiral Richard E. Byrd in the Bear, thereby setting a new mark in polar exploration in the Antarctic, was reported to the Navy Department today in a dispatch from the Bear.

The text of the dispatch follows:

"The U. S. S. Bear, veteran of many a polar voyage, added a page to Antarctic history today by penetrating thickly packed ice floes almost to the eastermost limit of Sulzberger Bay. Favored by an open lead which had been discovered by Rear Admiral Richard E. Byrd, U. S. N., retired, in a five-hour plane flight yesterday, the Bear had better than an even chance of gaining an entrance to an ice-free sea eighty miles long close to the coast of little-known Marie Byrd Land.

"Already the little barkentine, under the command of Lieut. Comdr. Richard H. Cruzen, U. S. N., has worked her way farther east from Little America, at that latitude, than any other vessel in the history of Antarctic exploration.

"Admiral Byrd's discovery of open water to the eastward was made during his second successful flight since the Bear left the Bay of Whales last Friday on a cruise of exploration. It culminated eleven previous attempts by the admiral, since 1928, to reach the eastern shore of Sulzberger Bay by ship or plane and three attempts since last Saturday. The area marks the westernmost limit of the longest uncharted coastline of Antartica.

"Carrying a flight crew comprised of Admiral Byrd, Aviation Pilot Ashley Snow, U. S. N., and Co-Pilot Earle B. Perce, radioman first class, U. S. N., the twin-motored seaplane took off with 240 gallons of gasoline at 4:20 P. M. local time.

"The plane was headed first for Edsel Ford Range over the eastern horizon but, in the vicinity of Chester Mountains, encountered soupy fog. That condition, coupled with an erratic compass, an expected phenomenon in such latitudes, forced them to change to a northerly direction.

"Emerging from the fog, Admiral Byrd said later, they found themselves only 50 feet above elevated ground. At a safer altitude and over the sea again the plane followed an open lead which gradually broadened and opened into a great expanse of water entirely rid of ice. After scouting out a suitable lead for the Bear, the Admiral doubled back and alighted alongside the ship at 8:58 P. M."

OFFICIAL PHOTOGRAPHS

Pictures in this issue showing the current Antarctic expedition are Official Photographs of The United States Antarctic Service and were received direct by the American Polar Society for publication in "The Polar Times."

The photograph on the cover showing the *Bear* and the *North Star* at the Bay of Whales was taken in mid-January 1940.

DISASTER ESCAPED BY BYRD'S FLAGSHIP

Seaplane Is Aid in Saving Bear as Ice Closes In on Her Three Times

WASHINGTON, Jan. 31—The Bear, flagship of the Antarctic expedition under Rear Admiral Richard E. Byrd, narrowly escaped disaster in the Antarctic ice pack on Monday, the admiral reported in a dispatch made public by the Navy Department today.

"The U. S. S. Bear emerged from the Antarctic ice pack late today after one of the narrowest escapes of her long career," it was stated in the dispatch.

"Three times within forty-eight hours the Antarctic service flagship appeared certain to be caught in rapidly closing pack and, but for her seaplane, a twin-motored Barkeley Grow, she might have frozen fast.

"The closest call came today (Jan. 29) at 3:30 A. M., local time, when newly forming sea ice threatened to consolidate the pack for miles around the ship, and made a third take-off of the plane impossible, but the Bear, staunch veteran of many a skirmish with grinding ice floes, churned astern into a narrow stretch of open water.

"Thirty minutes later the plane landed alongside the ship with news of a distant lead, a fifty-fifty chance for safety.

"Growlers" Threaten Ship

"It was hard going. Shuddering stem to stern with each successive shock, barkentine gradually carved herself a channel alternately backing and steaming into the ice at full speed.

"Once her heavily armored bow slid forty feet out of water before the ice gave way beneath her keel.

"Nor did all the danger lie ahead. Heavy growlers crunching along her ice-scarred sides menaced the threshing propeller, making it necessary to station bluejackets equipped with hand-set telephones at her stern.

"Even when the last of the ice pack dropped astern the Bear was not out of danger for a few miles off Cape Colbeck, she ran into one of the most decided hazards to Antarctic navigation; sea smoke dropped visibility to zero so that Captain Cruzen, mindful of icebergs close at hand, rang her engines to a dead stop.

"When the sea smoke lifted later, watch officers sighted seventy-five-foot cliffs of surf-washed barrier a scant 2,000 yards away."

Was Ready to Land Crew

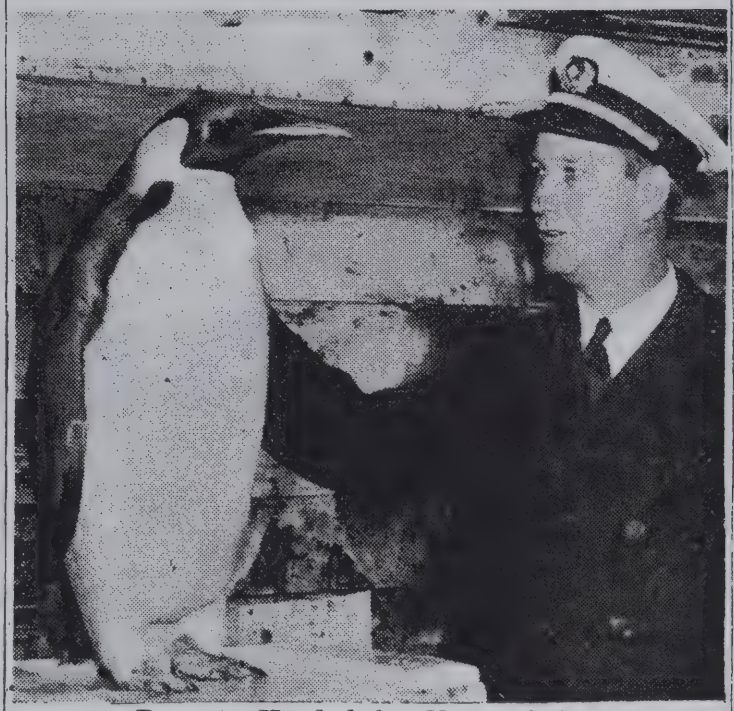
Admiral Byrd recalled afterward that he had been so apprehensive regarding the situation that he had planned to evacuate as many men as possible by foot or plane so as to subject a minimum number to the risk of a Winter in the Antarctic pack.

"I don t believe that any ship in the world could have gotten through that ice," the dispatch quoted him.

In his journal, the admiral logged the eleven-day cruise, together with his four subsequent exploratory flights, as one of the most important ventures of his career, geographically speaking.

Using the Bear as a mobile base, he recorded he had been able to delineate more than 300 miles of uncharted coast-line east of Marie Byrd Land, and to map many new mountain peaks beyond the easterly limits of the known coastline.

In addition, he has brought back to civilization word pictures, sketches or photographs of a great elevated plateau, new glaciers, a 4,000-foot mountain forty miles long, and a great, partly snow-covered island.



Penguin Headed for National Zoo

Chief Officer Ernest Prather of the Santa Clara is pictured with the emperor penguin, "Dugan," sent by the Byrd Expedition to Washington. The bird is named for Pat Dugan, a member of the crew of the North Star, one of the Byrd supply ships, which brought the bird to a Chilean port.

Byrd's Ship at Valparaiso

WASHINGTON, Feb. 15

A message from the expedition read:

"Aboard the U. S .S. Bear, Feb. 14 (Lat. 69 degrees 15 minutes S., Long. 139 degrees W.). In need of fuel and fresh water, the Antarctic Service supply ship U. S. M. S. North Star today neared Valparaiso. The Chilean port which she will reach late tomorrow will be the little vessel's first port of call since Jan. 3 when she sailed from Dunedin, N. Z., for Little America and the Bay of Whales. Two members of the East Base ice party, Supply Officer Robert Palmer and Aviation Machinist's Mate, First Class, William A. Pullen, U. S. N., and more than 400 tons of miscellaneous supplies waited her arrival.

"The supplies, which include a twin-motored Curtis Condor navy plane and prefabricated houses will be loaded as speedily as possible to permit prompt departure for the vicinity of Alexander Land, south of Cape Horn, where next month the Antarctic Service will establish its eastern base.

VALPARAISO, Chile, Feb. 15—Admiral Byrd's ship, the North Star, arrived at Valparaiso today to take aboard Argentine, Chilean and United States navel observers, and airplane and supplies.

SANTIAGO, Chile, Feb. 21—Completing preparations this afternoon, the motorship North Star, supply ship of Rear Admiral Byrd's Antarctic expedition, is in readiness to leave early tomorrow for the South Pole regions. Rear Admiral Junio Allard Pinto, chief of the Chilean Navy, on an official farewell visit today, made a thorough examination of the vessel. The Chilean officers, Exequiel Rodriguel and Federico Pont, and the Argentine officers, Julio Poch and Emilio Jocoz, especially invited by the American authorities, are on the ship in order to join Admiral Byrd.

Captain Isak Lystad declared that extensive studies would be made during the voyage to the polar regions, especially on weather forecasts, reports and charts for which a permanent contact would be maintained with the Argentine Meteorological Station in the Falklands.

VALPARAISO, Chile, Feb. 23 (A. P.).—The supply ship North Star of the United States Government's Antarctic expedition sailed today on its return voyage to Antarctica.

BYRD PARTY VISITS POLAR GHOST TOWN

28 Make 12-Mile Trip on Sleds or Skis to Old Little America Buried Under Snows

WASHINGTON, March 31—A visit to a ghost town of Antarctica was described today in a dispatch received by the Navy Department from Dr. Paul A. Siple, now in command of the west base of the Byrd expedition.

"Observing St. Patrick's Day as a holiday," he said, "twenty-eight men from west base at Little America celebrated with a visit by dog teams and on skis to the site of Old Little America, about six miles south of the present location of west base. Sixty dogs drawing seven sleds carried the men not adept at skiing."

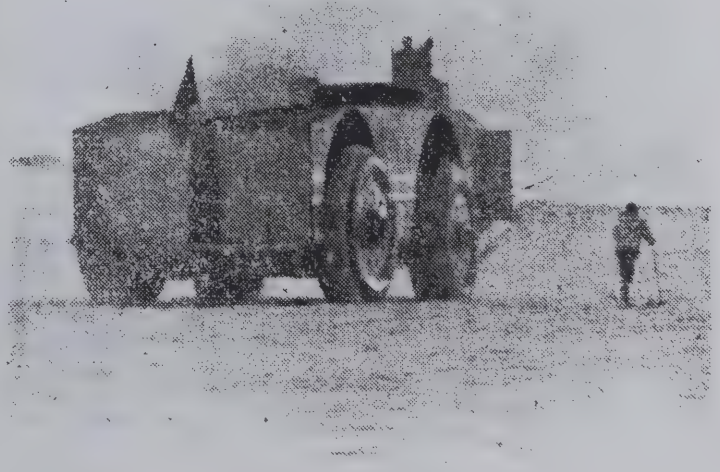
Within a mile of their destination the men caught their first glimpse of the radio towers.

"On closer approach it could be seen that the blades of the wind generator mounted atop one of the towers were revolving, giving a false impression of life in what had once been Antarctica's largest city," Dr. Siple said. "Submerged in the snow, the location of the buildings was ascertained by protruding stove pipes, radio antenna poles, and odds and ends of gear.

"Shovels were brought into use and it was only a matter of minutes before a skylight hatch had been uncovered. The building was in good condition in spite of the tremendous weight of snow which rested upon its roof. The room itself was littered and cheerless, and the chill, dank air brought an immediate sense of utter desolation to all.

"Scraps of foods were everywhere in evidence, fragments of the stock Lincoln Ellsworth and his pilot, Hollick Kenyon, had salvaged from the food tunnels when for six weeks during the Winter of 1935-36, they had used this same building as a refuge after abandoning their plane at the end of a flight from Palmer and to Little America."

The mess hall, science building and adjoining structures, all larger than the radio shack, were in various stages of collapse, with roofs caved in at the center.



BYRD SAILS ON BEAR FOR UNKNOWN AREA

Ship Quits Little America on New Explorations Far Away in Antarctica

WASHINGTON, Feb. 5—Admiral Richard E. Byrd's ship, the Bear, departed from Little America Saturday, according to a message received by the executive committee for the United States Antarctic Service from the Byrd party. She will proceed to the west side of the Ross Sea to make further explorations, leaving thirty-three men behind her to spend the next fourteen months on the Antarctic ice.

The message from Admiral Byrd's party stated:

"Shrilling three long blasts of her whistle, the U. S. S. Bear left Little America tonight. Only four men and a shivering dog team huddled in a small silent group on the edge of the ice saw the Bear departure, but two miles distant twenty-nine other members of the United States Antarctic Service must have paused to listen. For them the Bear's departure meant the beginning of fourteen work-filled, lonely months in the bleak Antarctic. At the bay's edge banter between the ship and ice was replaced by cheers as the Bear got under way. Long after the ship had left the four tiny figures could be seen waving farewell.

"On returning to Little America last Tuesday from his swift, deep thrust into unknown areas far to the eastward, Admiral Byrd found construction of new Little America well under way. Under the direction of Dr. Paul A. Siple, members of the ice party had raised a cook tent, three sleeping tents, two work tents, and nearly completed construction of permanent living quarters. In addition, nearly 300 of the base's 500 tons of supplies had been hauled by dog and tractor sledges from the main cache two miles away.

"Just outside the camp sprawls 'dog town' and its inevitable cache of seal meat, which Biologist Jack Perkins and fellow seal hunters, with the long Winter night in mind, are increasing the rate of from ten to twenty carcasses a day. Already one seal has been found, Perkins reported, bearing an identification mark of the second Byrd expedition of 1933-35.

"Hurrying against coming darkness and cold, the ice party is working in twelve-hour shifts to take advantage of a sun that never sinks below the horizon at this time of year. Windburned and bewhiskered, the men show signs of fatigue but none of dejection or hardship.

"There is no illness, and all hands are confident that they will be able to move into their insulated permanent living quarters by Saturday."

Expedition Dines on Turkey

WASHINGTON, Feb. 14—In another message given out today but dated Monday the admiral told of the turkey dinner the members of the expedition ate on Sunday. This message follows:

"Yesterday, eighteen days after the motor ship North Star left them isolated in Antarctica, thirty-three men, comprising the entire West Base and the snow cruiser personnel of the United States Antarctic Service, sat down to gayly decorated tables in their newly constructed home and enjoyed a sumptuous turkey dinner with all the fixings.

"At the head of the table sat the base leader, Dr. Paul A. Siple, under whose splendid direction so much toward the establishment of the base has been accomplished in this short space of time. It was 'housewarming day' and a general holiday for all hands, the first day of rest since their arrival at Ross Ice Barrier, Bay of Whales, on Jan. 12.

"During the period since the departure of the North Star on Jan. 24, a tremendous undertaking has practically been accomplished under the direction of the base carpenter, Raymond D. O'Connor, private, United States Army—the task of erecting the main house has been accomplished under most adverse conditions.

"Through fair weather and biting blizzard, dog drivers, most of whom were inexperienced at the outset, have tramped hard the trail between the cache at the end of the barrier and the base site, hauling hundreds of tons of housing materials, machinery, tools, food, clothing, coal and general equipment, until today but a very small amount remains to be hauled to permanent storage at the base.

Tent Colony Moves Inside

"Aiding in this transfer of supplies has been a single small army tractor, the only motorized transportation available at the base. Until the opening of the main building yesterday expedition members had endured discomforts of living in tents.

"Men, many of whom never before had experienced living in the open, even under ideal conditions, soon adjusted themselves to sleeping in sleeping-bags stretched out on the snow. During this time the mess tent, where Sigmund Gutenko, ship's cook, first class, United States Navy, West Base cook, prepared hot meals over a range, improvised from ordinary heating stoves, was a popular rendezvous.

Laying out "dog town" at the West Base

Air Flight Uncovers Evidence of an Undiscovered Island Under Ross Barrier

WASHINGTON, Feb. 19—A message received today by the Navy Department from Rear Admiral Richard E. Byrd read:

"Antarctic expedition leaders reported today new evidence that the Bay of Whales owes its existence to huge ice-covered land masses far inland from Little America," the message read. "The theory was supported by observations made during a six-hour flight on Feb. 12 to Lat. 81 degrees 8 min. S., Long. 176 degrees 15 min. E. by Base Leader Paul A. Siple, Senior Scientist F. Alton Wade and Technical Sergeant Theodore A. Petras, U. S. M. C., attached to the Armor Institute of Technology's snow cruiser.

"With Pilot Petras at the controls of the expedition's single-motored plane, used by Dr. Wade on his recent reconnaissance flight to Rockefeller Range, the flight party flew southwest from Little America 260 miles before turning back.

"Three times along the way and at the farthest point reached, Dr. Siple reported the party sighted surface fractures which indicated that, at those points anyway, Ross Barrier probably rested upon either the ocean bed or mountain peaks slightly above the sea level.

"Some of the broken areas reported apparently were similar to several sighted and photographed by Rear Admiral Byrd in a plane flight on Jan. 21, 1929. The scientists also told of finding indications, which will be further investigated, of an heretofore undiscovered island under the barrier, just east of Roosevelt Island.

"At Little America the bulk of the barrier cache has been hauled to the main base; sealing parties have been busy since Feb. 1 and have added from fifteen to eighteen seals each day to the Winter's blubber supply. A record catch to date is twenty-three seals hauled in by Biologist Jack Perkins and Raymond Butler. On completion of the seal cache, the camp will concentrate on preparing dog sledges and pemmican for a trail party

LITTLE AMERICA III ON JANUARY 24, 1940

BYRD AIDE SIGHTS 2 EXTINCT CRATERS

Discoveries on Flight by Dr. Siple Also Include Island in Antarctic Bay

WASHINGTON, Feb. 13—Discovery of extinct volcanoes in the Antarctic were reported to the Navy Department today in a radio message from the Byrd Antarctic expedition. The message read:

"Flying far to the east of Little America, Dr. Paul A. Siple sighted and identified today the chain of mountain peaks discovered by Rear Admiral Richard E. Byrd, U. S. N. (retired), in an exploratory flight eastward of Edsel Ford Range Jan. 26.

"The west base leader reported that a partially exposed island in Arthur Sulzberger Bay and two uncharted volcanoes now extinct also were discovered east of Raymond Fosdick Mountains.

"In addition, Photographer First Class Charles C. Shirley, U. S. N., a member of the flight crew, made numerous aerial photos in the vicinity of Mount Cooper and the Raymond Fosdick Range, and mapped several heretofore little known mountain regions.

"'A splendid achievement,' commented Rear Admiral Byrd, when word of the party's safe return was flashed to the U. S. S. Bear. 'I'm glad to know that the western end of the newly found peaks east of Ford Range have been tied in with mountains already known. It was a grand flight.'

"In addition to Dr. Siple and Shirley, the flight party was comprised of Pilot Aviation Chief Machinist's Mate James C. McCoy, U. S. N.; Staff Sergeant Walter R. Giles, United States Marine Corps, co-pilot and radio operator, and Lawrence Warner, geologic observer.

"It was an anxious moment when McCoy gunned the navy's twin-motored Curtis Condor plane and lifted her into the air at exactly noon, Greenwich meridian time. Weather, surface conditions and the necessity of carrying full fuel tanks, rations, skiis and other trail equipment, including a man-hauling sledge, make the start of every long-distance flight in Antarctica a major undertaking.

"Visibility was excellent as the heavy plane droned eastward before a moderate southwest tailwind and, at 3:25 P. M., it passed over La Gorce Mountain at an altitude of 7,000 feet. Clouds lay between Mount Cooper and Mount Grace McKinley, but clear skies ahead justified remaining on an easterly course.

"In the vicinity of Mount Cooper's southern extremity the plane circled for Shirley to photograph several uncharted peaks and then the plane headed in a northeasterly direction, where, in the vicinity of the Raymond Fosdick range, he was able to photograph two volcanic remnants never before recorded. It was from that position that Dr. Siple sighted far to northward the 4,000-foot mountain mass discovered by Rear Admiral Byrd a fortnight ago from the Barkley Grow seaplane.

"After photographing the unnamed mountain, which appeared to be mostly granite, the navy plane flew toward the chain of peaks reported by Rear Admiral Byrd late in January while he was on another reconnaissance flight from the U. S. S. Bear. After reaching the nearest of the peaks, however, heavy clouds and blinding drift from the northeast forced the party back, although the coastline was clearly visible on the northwestern horizon.

"The return flight was uneventful except for discovery of what appeared to be a rock island in Sulzberger Bay.

Greeted by Exultant Yells

"Greeted by exultant yells from her ground crew, the plane circled in for a landing at Little America at 8:30 P. M., having flown approximately 750 miles. 'Congratulations to you and your crew, as well as the ground force,' Admiral Byrd radioed to Dr. Siple immediately. 'It was a splendid flight.'

"Dr. F. Alton Wade, in charge of the Armour Institute of Technology's snow cruiser's Beechcraft plane, meantime reported satisfactory completion of a four-hour reconnaissance flight over Rockefeller and Alexandra ranges northeast of Little America. Dr. Wade reported that a second flight will be made to the same area before the long Winter night begins, and if possible, a landing made for collection of geologic specimens.

"In a radio message to Rear Admiral Byrd, Dr. Wade voiced belief that the area too long had been sadly neglected geologically. Six hundred miles due north of the Bay of Whales, the U. S. S. Bear is steaming toward Palmer Land, having completed a ten-day exploratory cruise to Queen Victoria Land, where Admiral Byrd planned to take bearings on the little known South Magnetic Pole.

FREAKS OF DATE LINE ABOARD BYRD'S SHIPS

One Vessel Has 2 Days at Time, Other a 30-Day February

It is a commonplace that ships gain or lose a day in the Pacific by the act of crossing 180 degrees of Longitude. But word from the two ships of the United States Antarctic Service tells of some unusual experiences with this international date line.

The day lost by the North Star in crossing to New Zealand was Dec. 25; so Christmas was celebrated by Admiral Richard E. Byrd and his men on the 26th. On Monday, Jan. 8, the vessel approached the 180th meridian from the west and sailed southward on it. This immediately plunged the port side back to Sunday, Jan. 7. The men seated on the port side of the dining saloon demanded a repetition of the previous day's chicken dinner, but could persuade the chief steward to repeat only the hors d'oeuvres.

The Bear, which lingered in the Ross Sea after the North Star had departed from that polar water, crossed the international date line, eastbound, on Feb. 9. Since this meant turning the ship's calendar back a full day in a leap year, those aboard had a February of thirty days.

ANTARCTIC NIGHT HALTS BYRD FLYING

Siple, on Last Flight Before Next 'Dawn,' Maps Ranges Beyond Beardmore Glacier

WASHINGTON, March 12—The coming of the Antarctic night has ended extensive exploratory flights by Rear Admiral Byrd and other members of the United States Antarctic Expedition until the dawn of another Antarctic day.

In a dispatch from Little America to the Navy Department the expedition reported today that a flight on Feb. 29 was the "very last" that could be made with reasonable safety.

This was "Flight C," made in eleven hours and nine minutes by Dr. Paul A. Siple, west base leader, and Dr. F. Alton Wade, snow cruiser leader, from Little America to Beardmore Glacier for aerially mapping the previously unexplored mountains extending from that point to Live Glacier, 100 miles to the southwest.

James C. McCoy, Naval Aviation chief machinist's mate, was pilot and Walter B. Giles, staff sergeant of the Marine Corps, co-pilot. Also in the party was Charles C. Shirley, navy photographer, first class.

Despite a load of 924 gallons of gasoline and a soft snow surface left by a blizzard on the previous day, Pilot McCoy lifted the plane after a run of eleven seconds and at 2:17 P. M. headed southwestward on a great circle course of 203 degrees for the mountains of Beardmore Glacier.

Progress of the Flight

"Flight 'C' had been scientifically laid out to cover almost entirely new paths never before traversed," the dispatch stated. "The first leg extended for 350 miles across the Ross Ice Barrier.

"At 4:55 P. M., the plane having been cruising at 87 to 90 knots, the first mountain peak appeared to the south, a pyramidal landmark midway along the unexplored escarpments to be mapped.

"At 5:12 P. M. the plane was flying above a crevassed area, unmistakably caused by land not far beneath the surface.

"By 5:15 P. M. the entire southern horizon was crested with mountain peaks, shimmering pink in the glow of the low Fall sun. These peaks were actually about 150 nautical miles distant, so that it was 6:30 P. M. before the eastern portal of Beardmore Glacier was reached.

"On the opposite side of the great glacier could be seen Mount Cloudmaker, characterized by flecky clouds about its peak. At this point the plane climbed to an altitude of 9,500 feet, making a slow circle while Shirley intently clicked his large aerial camera trained through a porthole.

"Some of the surrounding peaks rose to an altitude of 13,000 to 14,000 feet. Many of them exhibited the flat-lying sedimentary layers of Beacon sandstone formations, while the foothills showed igneous formations.

Racing the Sun Homeward

"The final photographic circle was made at 8:30 P. M., tying in the mountains and glaciers photographed by Captain Ashley McKinley when Admiral Byrd made his polar flight in 1929. The plane was then south of the 85th parallel of latitude near the 165th meridian.

"The next leg of the flight terminated at about Latitude 84 degrees 10 minutes south, Longitude 150 degrees west, where the course turned due north. At this point weather conditions below the plane became unfavorable.

"After reaching Latitude 83 degrees 17 minutes south, it was decided to turn back toward Little America where radio reports indicated reasonably clear weather.

"Meanwhile the blazing low Antarctic sun sank lower in the sky, but the northward movement of the plane approximated so nearly the apparent rate as that of the sun that for more than one hour the same segment remained on the horizon.

"Thus the crew enjoyed one more Antarctic night without a sunset which has not been the case at Little America for ten days.

"At about 12:15 A. M., March 1, Roosevelt Island was sighted. By 1:15 A. M. the plane was circling Little America and a few moments later Pilot McCoy brought the great yellow ship down to a perfect landing on the surface."

21,050-FOOT ASCENT MADE IN ANTARCTIC

Plane Gets Cosmic Ray Data in Highest South Polar Trip

WASHINGTON, March 14—A description of a plane flight at the west base of the Antarctic Service was received today from Rear Admiral Richard E. Byrd, commanding officer. The radiogram, dated yesterday, follows:

"The skies cleared on March 9 and the plane attached to the snow cruiser unit immediately was prepared for flight. Dr. F. Alton Wade, senior scientist of the service, had been hoping to get in one more cosmic ray hop before the Winter night brought to a close flying operations, and the time seemed propitious.

"Technical Sergeant T. A. Petras, United States Marine Corps, was at the controls and Clyde Griffith, machinist's mate second class, Unitd States Navy, the mechanic attached to the cruiser, acted as cosmic ray observer. After a series of preliminary measurements were made at the surface, the plane took off. Sergeant Petras leveled the plane off for five minutes at 8,000 feet in order for the cosmic ray apparatus to properly register the incoming radiations

"At an altitude of 21,050 feet over Little America, the plane was still climbing, but as the temperature was then 45 degrees below zero Petras decided to descend. The plane landed and Petras and Griffith hopped out, still shivering. As far as we are able to determine from past records, the altitude surpasses any past performance in the Antarctic by several thousands of feet."

POLAR SYMPOSIUM

Dr. Edwin G. Conklin, Executive Officer, American Philosophical Society, 104 South Fifth St., Philadelphia, Pa., advises that the papers offered at its recent meeting in celebration of the Wilkes Centenary and dealing with American polar exploration will soon appear in a separate number of the Proceedings of the Society. They will occupy about 100 pages and will be on sale for approximately one dollar.

BYRD SHIP FIGHTS A GALE OF 70 MILES

Rear Admiral Radioes Story of Fierce Winds Along Icy Coast Devoid of Anchorages

WASHINGTON, Feb. 9—Rear Admiral Richard E. Byrd has radioed, under date of Feb. 7, the story of a stormy voyage by the steamship Bear through ice-clogged and gale-swept Antarctic waters during which the Bear reached a point close to the South Magnetic Pole.

"The U. S. S. Bear plowed through icy Antarctic seas off the gale-swept coast of Queen Victoria Land tonight close to the South Magnetic Pole," the message said. "Purpose of the 600-mile cruise to north and west of Little America was to attempt to add to the world's knowledge of one of its little known sciences—terrestrial magnetism.

"Probably no coastline in the world offers as many obstacles to navigators and explorers as the eastern coast of Queen Victoria Land. Harbors are unknown, while the coast itself is comprised almost entirely of rocky precipices 100 to 1,000 feet high or equally forbidding ice cliffs, against which any ship would be smashed to bits in a moment.

Ship's Chain Cannot Reach Bottom

"There are no anchorages charted because here no ship's chain can reach bottom. Off-shore lie icebergs and fog; inland, long snow-covered mountain ranges stretch beyond the barrier as far as the eye can see. Birthplace of terrific gales and, always somewhere at sea, of course, lies the Antarctic ice pack with its tentacles shuffling back and forth with each new vagrant current.

"The little Bear, already battered and scarred from her eastern exploratory cruise last month, has had two generous samples of Victoria Land weather. As she emerged from Terra Nova Bay last Monday, where she found a herd of 200 seals but no shelter, a 70-mile-an-hour gale struck suddenly with incredible force.

"Near-by Mount Melbourne's 8,000-foot peak glittered in the sunlight, placid and serene, but, on the bay below, the wind shrilled through the Bear's rigging, tore at her deck cargo and threatened for long minutes to hurl her against the steep volcanic cliffs. A storm trysail, hastily rigged by bluejackets, bellied taut as a drumhead but failed to hold the ship to windward. An hour later the storm abated.

Gale Hits Without Warning

"A similar gale swept down on the ship yesterday as, sailing under a cloudless sky, she attempted to skirt an uncharted ice tongue north of Drygalski Peninsula. Again she found herself without warning fighting for her life in a 70-mile-an-hour wind, and again she had to run for safety.

"Since entering Wood Bay, the closest approach that can be made by the sea to the Magnetic Pole, last Monday the Bear skirted 150 miles of ice-covered coastline without finding any suitable harbor or place to land. If one is found before advancing Winter forces the Bear to postpone further operations in this area," the admiral said that he would take instruments ashore in an attempt from some base on the ice sheet to establish the dip of the earth's magnetic lines and the Magnetic Pole's direction.

"Such observations," suggested Rear Admiral Byrd, "may indicate whether or not the Magnetic Pole has changed its position."

Byrd's Ship Runs Before a 60-Mile Wind; Icebergs Drive Bear Far Off Her Course

WASHINGTON, Feb. 16—The attempt of the Bear, flagship of the United States Antarctic Expedition, to penetrate far into the heart of the Antarctic ice pack has failed temporarily, because of heavy ice and other unfavorable conditions. A message from the expedition to the Navy Department read:

"Gales, snow and a limitless field of ice turned the United States steamship Bear back to open sea and safety today, after a pulse-quickening sixty-mile thrust into the heart of the Antarctic pack.

"Defeat was especially disheartening because, had the Antarctic service flagship held her course and speed for twenty-four hours more, she would have reached her objective—a suitable site for flight operations over an unknown sector of the Antarctic coast.

"Yesterday at noon, when a lead opened up to the southward, the Bear had been skirting the ice pack since Friday. She turned into the lead at 6:30 P. M., local time, when, after penetrating the pack approximately sixty miles, she encountered impenetrable ice floes, dead ahead, to port and to starboard.

"This proved to be her most southern point, for when she retreated a few miles north and attempted to cut to eastward she was soon virtually surrounded by ice. Next she ran into a thick snowstorm which reduced visibility to 300 yards and shortly after was struck by a strong wind which rapidly increased to gale force.

"At a hastily summoned conference, Rear Admiral Richard E. Byrd, Lieut. Comdr. Richard H. Cruzen and Bendik Johannsen, ice pilot, conceded defeat and agreed that the Bear should be turned back for a later attempt down a more easterly meridian. Barrier ice, reported farther south in 1934 by the Norwegian whaling ship Thornshaven, was not sighted.

WASHINGTON, Feb. 17—Rear Admiral Richard Byrd, who has been sending the Bear on a zigzag course through uncharted seas searching for an ice-free area suitable for launching his Barkley-Grow seaplane, has had no luck with his quest. According to a message dated yesterday, which was given out today by the United States Antarctic Service, the Bear had been driven 180 degrees off her course and was having a lively time of it in a sixty-mile gale on her way to Alexander Land.

The Bear gave her position as Lat. 67 degrees 4 minutes S. and Long. 129 degrees 38 minutes W. The message read:

"Under bare poles the little barkentine Bear scudded before a sixty-mile-an-hour gale today close to the Antarctic pack. All day icebergs and growlers, barely awash, forced the vessel bound for Alexander Land to run in a westerly direction, 180 degrees off her normal course. Shortly before dark, however, she bore to the northeast under upper and lower topsails in an attempt to clear the pack.

"Bluejackets going aloft to furl or set canvas found it a man-sized job; sleet-stiffened canvas tore at their hands or flapped wildly in the wind; lines eluded their grasp and the foot ropes, uncertain supports at best, gave slippery footing. Decks were constantly awash as green seas broke over the bow and weather-rail.

"Even Rear Admiral Richard E. Byrd's quarters were not immune; one boarding seas pouring through a ventilator completely drenched his cabin. At times the Bear rolled fifty degrees from port to starboard, sending men and furniture careening across the officers' wardroom and making it necessary to serve and eat all meals standing. Even late tonight there were no signs of the gales abating."

BYRD REPORTS SHIFT OF MAGNETIC POLE

Observations Taken From Bear, 195 Miles From the Nearest of 4 Positions

WASHINGTON, Feb. 14—Rear Admiral Richard E. Byrd, head of the Antarctic Expedition, reported today in a radio message to the Navy Department that his observations indicated that the South Magnetic Pole had shifted its position. The observations did not definitely state the present postion of the pole.

The message read:

"Magnetic observations made in Queen Victoria Land indicated today that the South Magnetic Pole has shifted. The observations did not definitely establish a new position for the pole, but indicated that it probably had moved in a westerly direction from at least three of the four positions reported since 1909. Admiral Byrd reserved further comment, pending more detailed analysis of his calculations.

"The observations were made while the Bear was moored alongside shelf ice in the vicinity of Drygalski Peninsula last Feb. 7. All the instruments were removed some distance from the ship, of course, to avoid any magnetic interference.

"This station, it was computed later, was only 195 miles from the nearest of the four magnetic Pole positions previously reported. From that bleak and windswept ice shelf located at Latitude 75 degrees 10 minutes 30 seconds South and Longitude 163 degrees 37 minutes 30 seconds East, the magnetic pole, the exact position of which has never been verified, bore 310 degrees true, allowing for a natural curvature.

Mawson's 1912 Chart Cited

"Admiral Byrd estimated that it lay only a few miles to eastward of the position charted by Sir Douglas Mawson in 1912. It lay westward, however, of three other positions suggested by terrestrial magnetists, including that reported by Professor David When he visited the area in 1909.

"Interest of the magnetic party centered on the Admiral's delicate dip circle, the needle of which is

SILHOUETTED against the Antarctic horizon, a dog team carries a huge spare tire of the snow cruiser

adjusted to swing up and down, as well as from side to side, thereby indicating the true direction of near-by lines of magnetic force. Because the needle takes a perpendicular position only at the magnetic pole, observers at the Drygalski Peninsular station were elated when the needle quivered to a stop only a few degrees from vertical. It was apparent that even where the party stood magnetic lines were descending practically straight into the earth."

Admiral Byrd did not elaborate upon his theory that the South Magnetic Pole was moving in a westerly direction, but recalled that eminent magnetists are in virtual agreement that the pole covers an area of ten or more miles and appears to shift from year to year.

"Is is my own theory," he added, "that the movement is to westward. On the only three charts immediately available, the British chart indicated that the pole lay at either Lat. 72 degrees 25 min. S, Long. 155 degrees 10 min. E., or at Lat. 71 degrees 24 min. South, Long. 148 degrees 20 min. E.; the two American charts gave its location as Lat. 72 degrees 30 min. S., Long. 158 degrees E.

BYRD IS BALKED AGAIN BY SNOW AFTER GALE

Four-Day Wind Moderates, but Flight to Coast Is Prevented

WASHINGTON, Feb. 21—A story of gales and ice which have battered the steamship Bear, flagship of the Antarctic Expedition, for days was sent to the Navy Department today. It read:

"Snow, darkness and ice—the tireless watchdogs of South Polar Sea—combined forces tonight to prevent the U. S. S. Bear from getting her plane within striking distance of the Antarctic Coast. The southwest gale, which tore at the Bear's rigging and drenched her decks with icy seas for four consecutive days, had moderated, but thick snow flurries and deepening twilight led Lieutenant Commander Richard Cruzen, U. S. N., to order the vessel hove-to until dawn.

"Eeerie silence spread over the gently heaving sea like a gray blanket; it was broken only when an occasional ice growler grated against the hull or bumped protestingly along the keel. Slush, lifting on the easy swell, hissed softly against the vessel's sides. Aloft a block creaked somewhere, a dangling line slapped against canvas, and once, far away, a solitary penguin gave a frightened squawk. The rest was silence.

Glimpse of Sun Fixes Position

"Turned back earlier in the day by the same bad weather which five times in as many weeks has balked expedition attempts to reach Antarctica's longest unknown coast. Rear Admiral Richard E. Byrd plans to make another attempt tomorrow. A momentary glimpse of the sun has enabled the ship's navigator, Lieutenant George J. Dufek, U. S. N., to fix the Bear's position within a few miles of the southernmost point reached by the S. S. Jacob Ruppert of the Second Byrd Expedition in 1934.

"The ice pack already shows early signs of freezing, however, and may offer no further opportunity for exploration in this longitude during the current season.

"Chagrined at finding the same unfavorable conditions in the pack he has encountered on previous visits to this area, Rear Admiral Byrd exclaimed: 'Now we have been battling in this area for a week, I can understand why no one has ever been able in the last 100 years to penetrate to the unknown coastline.'

Rigors Tell on Men's Nerves

"Everyone is in good health, but the long cruise, the rigors of Antarctic weather, and the constant presence of danger is telling on the nerves of all hands. Twilight, which lasts from 11 P. M. to 3 A. M. at this time of year, makes ice navigation hazardous and difficult.

"Lieut. Comdr. Richard H. Cruzen, U. S. N., and Ice Pilot Bendik Johannsen, alternating watches in the crow's nest, haven't averaged three hours of sleep a night for a week. The gigantic bergs, deathly still except for the sea sobbing in their underwater caverns, pass wraith-like in the snow and darkness, as if drawn by some invisible hand.

"Land may be near; three penguins and one seal, which seldom venture far from shore at this season, have been sighted on small floes. Sounding apparatus, furthermore, records only 300 fathoms, as contrasted to 2,000 fathoms yesterday.

"Whether the shallows are part of a continental shelf or due to an elevation of the ocean's bottom must remain conjectural until additional recordings can be made."

BYRD SHIP PUSHES TO A POLAR RECORD

Bear Reaches Farthest Point in Pacific Quadrant, Topping 1934 Mark of the Ruppert

WASHINGTON, Feb. 23—In a radiogram to the Navy Department, Rear Admiral Richard E. Byrd stated today that the Bear, flagship of the Antarctic expedition, had established a new American record for exploration in the Pacific quadrant of Antarctica. The Bear was thirty-seven miles south of the seventieth parallel, about 1,300 miles from the pole.

The message read:

"At 8:20 A. M. local time the expedition vessel lay at Lat. 70 degrees 37 minutes S., Long. 110 degrees 35 minutes W., or thirty-five miles south of the farthest point reached by any previous American explorer in this area. The earlier mark set by Rear Admiral Richard E. Byrd, U. S. N. (retired), with the steamship Jacob Ruppert in 1934, was first bettered yesterday at 3:30 A. M. local time, when the Bear bucked through pack ice, bergs and snow squalls to Lat. 70.06 S., Long. 116.03 W., four miles farther than the Ruppert's dead-reckoned position in 1934.

"It also lay south an undetermined distance of the southernmost point reached by the Norwegian whaling ship Norvegia in 1929. There the Bear ran into trouble. Turned back by solid pack, icebergs and poor visibility, she found retreat virtually impossible.

"Lieutenant Commander Richard N. Cruzen, U. S. N., and Ice Pilot Bendik Johannsen conned the ship slowly through the ice field, winding a tortuous channel or carving a new one whenever necessary."

The belief was expressed that if the vessel had remained in the ice one more hour she might have been caught and frozen fast.

"At midday the Bear was skirting the pack on an easterly course but bearing slightly southward, and this course was followed until early evening, when she hove-to just off the ice pack for a reconnaissance flight by Lieutenant George J. Dufek, U. S. N. navigator. He reported clear water for seventy-five miles in an east-southeasterly direction. Star sights established the ship's position and at 8 A. M. today she steamed into Bellingehausen Sea at Latitude 70.37 south, Longitude 110.47 west."

BYRD'S NAVIGATOR CHARTS NEW AREA

Plane Flies Over Region East of Coastal Mountains Discovered by Explorer

WASHINGTON, Feb. 28—More facts about discoveries made by the brigantine Bear, flagship of the United States Antarctic Expedition, were sent to the Navy Department today. The message read:

"Lieutenant George Dufek, U. S. N., today explored and charted 100 miles of new land east of the coastal mountain region discovered yesterday by Rear Admiral Richard E. Byrd. The flight also led to discovery of new mountains to the eastward and disclosed that two ranges, sighted from a distance by Rear Admiral Byrd yesterday, ran parallel along the coast in a east and west direction. The entire area, sought by explorers since 1774, lies in the so-called Pacific Quadrant of Antarctica, approximately 1,200 miles east of Little America.

"Today's flight, like yesterday's was made in the seaplane, with Aviation Chief Machinist's Mate Ashley C. Snow, U. S. N., at the controls, and Radioman First Class Earle B. Perce, U. S. N., operating the plane's two-way radio equipment. Lieutenant Dufek, navigator of the Bear, whom the admiral long ago promised an opportunity to explore in this area, was observer during the flight.

"Keenest anxiety developed for the flight party's safety. Only an hour after it left the ship, when the plane's radio set went dead, suspense increased markedly—especially when heavy clouds began to gather to southward and, as the time approached when her gasoline supply would give out, all hands were tremendously relieved when the plane finally hove in sight just before clouds lowered to 250 feet.

"After the takeoff, Lieutenant Dufek reported, the plane flew due south for fifty miles. Land was raised ahead and to port, so a southeasterly course was followed for another 100 miles, during which time Lieutenant Dufek plotted a score of mountain peaks from 3,500 to 4,000 feet high running in parallel ranges.

"Occasionally the observer reported deep blue areas were sighted which were difficult to identify from an altitude of 5,500 feet, but which appeared to be either open water or exposed blue ice. Far inland lay a snow-covered elevated plateau.

"Although a defective dynamotor prevented the plane from dispatching messages, incoming signals were clear, and the homing device functioned perfectly. There was no difficulty on the return flight until the plane ran into low-lying clouds. Visibility was good close to the water, but huge hulking icebergs, their tops hidden in mist, were a constant menace. Four times before reaching the Bear the plane had to swerve around bergs on his return to the ship.

"A radio message from Dr. Paul A. Siple, leader of the expedition's westernmost base, meantime told of Winter preparations at Little America. Private Raymond D. O'Connor, United States Army, base carpenter, is erecting two new buildings, the machine shop and the science laboratory ,which will be connected with the main building by snow tunnels.

"Bad weather had grounded the base's two planes, but dog sledges, harness, and a supply of dog pemmican, consisting of half-pound bricks of rendered seal oil and meal, are being readied for the Fall sledging party

"Highlights of last week included recovery of the army tank from the snowdrift, where it had lain for five weeks, and the base party's first sunset since landing in the Bay of Whales.

"Correctly speaking, astronomically, the sun first dipped below the horizon Saturday evening but, because of clouds, it was Sunday before the explorers for the first time since crossing the Antartic Circle early in January, saw the sun dip its lower limb below the far horizon. Darkness will increase from now until the sun disappears completely late next month."

WHALING HUNT BEGINS IN ANTARCTIC FIELDS

Nine 'Killer Boats' and Mother Ship Are in U. S. Expedition

With one United States ship at the whaling grounds, the 1939-40 season on baleen whales opened in the Antarctic recently, it was reported by the Bureau of Fisheries of the Department of the Interior. The season will continue three months.

Nine "killer boats," plus the mother ship, S. S. Ulysses, will represent the United States' lone expedition this Antarctic season, according to information received by Charles E. Jackson, acting commissioner of the Bureau of Fisheries. The Ulysses, a "factory reduction" vessel, sailed from Norway in October.

At Curacao, Dutch West Indies, where the Ulysses fueled on the way to the south polar whaling grounds, two United States Coast Guard officers joined the expedition. They are charged with the enforcement of the convention for the regulation of whaling, the Whaling Treaty Act, regulations thereunder, and treaties supplementing the convention of Sept. 24, 1931.

Last year's catch of the United States expedition, 1,113 whales, was considerably less than that in 1937. Although fewer countries this year are sending expeditions to the Antarctic, which is still the richest whaling field in the world, but is rapidly nearing depletion, it is impossible to predict at this time what results may be expected for the current season.

BYRD MAPS COAST NEVER SEEN BEFORE

Reaches South Pacific Edge of Antarctica and Finds a Great Mountain Range

WASHINGTON, Feb. 26—Rear Admiral Richard E. Byrd, commander of the United States Antarctic Expedition, has discovered in the South Pacific a great mountain range, an ice-covered island eighty miles from the shore, and a pack-enclosed sea. The story of the discoveries was wirelessed to the Navy Department today from the brigantine Bear, on which Admiral Byrd is making his headquarters. The message follows:

"Triumphing over fog, gales and ice pack, Rear Admiral Richard E. Byrd, U.S.N. (retired), commander of the United States Antarctic Service, today reached and photographed the long-sought South Pacific coast of Antarctica, 1,200 miles east of Little America. The coast line, which for the past 166 years has been the elusive goal of explorers of all nationalities, was sighted and mapped from the air when the U. S. S. Bear, after an eighteen-day battle with icebergs and blizzards, was halted by fog and pack ice at Lat. 70 degrees 43 minutes S., Long. 108 degrees 25 minutes W.

"In addition to filling in 200 miles of the new coast, the admiral discovered a vast mountain range to southward, rearing thousands of feet above sea level; an ice-covered island eighty miles off shore, mountains to the southeastward and a great pack-enclosed sea.

Party of Three on Flight

"The flight crew of the twin-motored seaplane was comprised of the admiral, who served as navigator; Aviation Machinist's Mate Ashley C. Snow, U.S.N., as pilot, and Radioman First Class Earle B. Perce, U.S.N., as co-pilot. Snow and Perce were also the admiral's companions on his exploratory flights east of Marie Byrd Land last January.

"Only a fortunate combination of circumstances made the epochal flight possible today, for the little Bear had been turned back from southward thrusts repeatedly since she left Little America three weeks ago for the long cruise eastward. Time and again the sturdy barkentine would follow tortuous leads far into the pack, which so jealously guards the Antarctic coast in the Pacific quadrant, only to be stopped by frosty fogs, violent headwinds or solid ice floes.

"If she found open water suitable for a take-off of the plane, a snow storm would make flying impossible or a change in wind would close the lead. Only through patience and persistence, the admiral advised, could the Bear and the plane achieve the expedition's objective.

"Plowing a zigzagging 1,250-mile track, mostly far south of previously explored sea areas, the Bear met with almost continuous storms, icebergs, freezing fog and snow. Increasing periods of darkness, certain portent of the approaching Winter night, slowed her progress and forced her to drift blindly several hours each night in inky-black, berg-dotted seas. Storms, too, brewed in Antarctic cauldrons, rattled the ship with hail or whitened her decks and rigging with snow for eleven consecutive days."

"Struggle Seemed Hopeless"

"The struggle seemed hopeless then. Yesterday, when the explorers noted signs of land, icebergs increased in size and assumed strange fantastic shapes. Now they hinted of a lofty barrier over the horizon. Sea birds increased in number and included the Wilson petrel, giant fulmar and ring-necked penguin. Crab eater and Weddell seals drifted by on ice pans, too sleepy or bored to even raise a head at the Bear's intrusion.

"The sea shallowed from 2,000 to 1,050 fathoms and then the deck watch pointed out an iceberg with a chunk of black rock embedded in its side. A few moments later another berg was passed bearing a jagged streak of volcanic dust. Spirits ran high when a long-sought lee for the seaplane was found between a huge tabular berg and the ice pack, but they were quickly dampened by the time the engines could be heated, tanks filled, and the plane swung overside.

"The lane of smooth water had narrowed perceptibly and, instead of taking off, the plane barely escaped being trapped between the floe and the berg. As it was, she was taxied back to the ship with difficulty, her pontoons nosing aside great chunks of floating ice. Then, with the plane just swinging aboard, fog shut down with the suddenness characteristic of most Antarctic weather.

"Today dawned bright, however, and the plane was readied in short order and launched. At 12:58 P. M. local time the plane lifted from the sea and soon after disappeared over the southern horizon. Terse radio messages brought word back to the waiting Bear that the coast had been discovered about 190 miles south of the vessel's position, and that the highest point of a mountain range was located about ten miles farther. But it was not until 4:10 P. M., when the plane returned, that the whole story of the flight was told.

Crossed 100 Miles of Ice Pack

"After the take-off, the party flew over a solid impenetrable ice pack for 100 miles, which is as effective a barrier for ships as fog and snow are for airplanes entering this area, and it is an eloquent reason, the Admiral suggested, why so many previous expeditions (including two of his own since 1929) seeking the coast in these longitudes have failed.

"Then, as far as the eye could see to westward, opened up a great ice-locked sea forty or more miles broad in a north and south direction. Several miles to the westward was a snow-covered island, lying approximately 110 miles due south of the Bear and eighty miles from the bleak and desolate coast. Beyond the coastline, like that discovered far to the westward last month, was glacier-covered and fringed with lofty barrier.

"Through all this dazzling whiteness rough mountain peaks broke through the surface, lifting their jagged slopes up to possibly 7,500 feet. Beyond stretched a wind-swept elevated plateau 2,000 or 3,000 feet high. Although visibility was excellent from the plane at 5,000 feet, and the range could be seen reaching away 100 miles in both easterly and westerly directions, the ice pack to seaward was covered with clouds. There was a brief reconnaissance flight for photographs and hasty sketches, and then, with her gasoline supply half exhausted, the plane turned homeward."

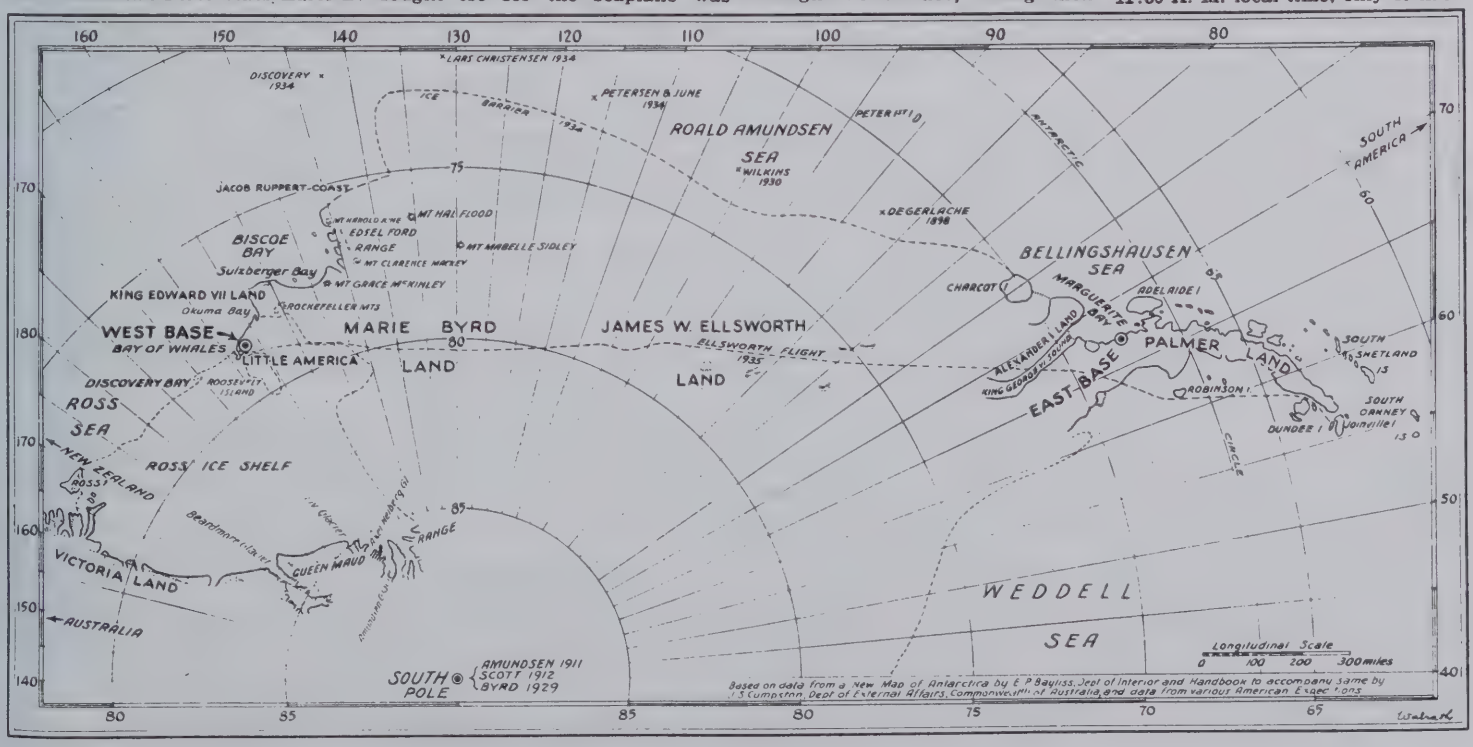
BYRD DISCOVERS LARGE PENINSULA

Mountain-Dotted Arm of Antarctic Jutting Into Sea Sighted From Airplane

WASHINGTON, March 1—Admiral Richard E. Byrd, commanding the Antarctic Expedition, has discovered a large peninsula and two islands on the South Pacific shore of Antarctica, a message received by the Navy Department said.

"Aboard U. S. S. Bear, Feb. 27. Lat. 69 degrees 44 minutes south, longitude 89 degrees 57 minutes west. Rear Admiral Richard E. Byrd reported to the executive committee of the United States Antarctic Service today the discovery of a large peninsula and two islands on the South Pacific coast of Antarctica. The islands and the mountain-covered peninsula were observed during a three-hour plane flight from the expedition flagship U. S. S. Bear, which was hove to near the ice pack at latitude 70 degrees 04 minutes 30 seconds south, longitude 95 degrees 19 minutes west.

"As on previous flights, the Admiral was accompanied by Aviation Chief Machinist Mate A. C. Snow and Radioman First Class E. B. Perce, two navy pilots. Mountain ranges were sighted to westward at 11:30 A. M. local time, only 40 min-



utes after the plane took off and headed south.

"From his altitude of 6,000 feet Rear Admiral Byrd could see a great mountain-dotted peninsula projecting seaward 190 miles to approximately latitude 72 degrees 45 minutes south. The peaks ranged in height from 2,000 to 3,000 feet. One long mountain, about 1,000 feet higher, was visible to southeastward in vicinity of the 96th meridian.

"The peninsula's western shore, the admiral reported, formed a huge ice-filled bay containing two islands, the easternmost of which lay at approximately Lat. 71 degrees 50 minutes S, Long. 96 degrees W.

"The coastline from there on, scored with numerous coves and inlets, ran southeast as far as the eye could see. Inland, high terrain and what appeared to be snow-covered ridges stretched to approximately the 88th meridian."

Byrd Discovers Six New Islands

WASHINGTON, March 4

The navy announced receipt of a radiogram from Admiral Byrd announcing the discovery of six islands in the Antarctic.

The navy's announcement quoted the text of the radiogram, which was as follows:

"The Antarctic service flagship U. S. S. Bear today discovered six small unknown islands off the coast of Alexander Land, 800 miles south of Cape Horn. The islands were sighted by officers of the Bear at 3:30 P. M., Washington time, approximately seventy-five miles east of Charcot Island. While the ship, unable to take celestial observations for four days, was beating through snow and fog toward the entrance of Marguerite Bay in Palmer Land, Rear Admiral Richard E. Byrd, expedition commander, warmly congratulated the Bear's entire personnel for the discovery. The Bear's southward track was a heartening indication, he added, that the ice pack lies farther south in this region than usual.

"The new islands lay at approximately latitude 69 degrees 05 minutes south, longitude 72 degrees 07 minutes west and differed markedly in position from those reported fifteen miles off Alexander I Land in 1937 by the English explorer, John Rymill. The six islands discovered by the Bear, bleak pinnacles of snow-covered rock, were only a few miles from the mainland. They were surrounded by heavy pack ice and offered no harborage. Shallowing water and darkness led Lieut. Comdr. Richard H. Cruzen, U. S. N., to order the vessel hove-to at 9:30 P. M."

"The United States Motorship North Star has arrived at Marguerite Bay from Valparaiso. Both vessels are hove-to, awaiting further developments."

WASHINGTON, March 5

From the Bear, flagship of the Byrd Expedition, the Navy Department received today by radio news of the charting of three islands and a reef.

"The Bear charted three islands and a reef off Palmer Land today, due west of Red Rock Ridge," said the message.

"The islands, apparently not seen by the British exploratory vessel Penola on its visit to this area in 1937, were first seen by the Bear late today when she entered outer Marguerite Bay in search of a safe harbor from which to make a reconnaissance plane flight.

ANCHORAGE FOUND FOR BYRD'S SHIPS

Shelter Behind Islands Located by Sea and Air Exploration of Horseshoe Bay

WASHINGTON, March 8—After a silence of two days the Antarctic Expedition radioed the navy today the story of its search for a base on the coast of Marguerite Bay. The message read:

"During flights of the seaplane on March 5, the coastline of Marguerite Bay was photographed with a mapping camera. After a study of these photographs it was found that only one or two locations might be suitable for the base.

"In the afternoon of March 6, after an examination of these locations by the two ships, the Bear found a site that was the most practical yet discovered for the establishment of the east base. About that time very strong easterly winds suddenly arose and the Bear had to seek refuge behind Neny Island.

"The North Star anchored there ahead of the Bear, in twenty-five fathoms of water. The wind attained the velocity of at least sixty miles per hour and, in the darkness that soon descended, an anchorage was hard to find. After considerable manoeuvring and anxious moments, anchorage was found; both anchors were let go in twenty fathoms of water. The wind slackened this morning and both ships proceeded to the site of the proposed base but found it completely blockaded by ice.

"After the ships failed to break through the ice, the North Star proceeded to anchor off Neny Island and the Bear proceeded up the coastline to search for a safe harbor, which has not yet been found.

"Horseshoe Island Bay, where the ships anchored on the night of March 5, was found late this afternoon to be full of ice. Because of the darkness the Bear was forced to heave to. Just before anchoring the Bear missed a submerged rock by thirty or forty feet."

WASHINGTON, March 9—An east base behind low-lying islands in the southeastern portion of Horseshoe Bay is expected to offer safe anchorage for the ships Bear and North Star of the Byrd Antarctic Expedition.

"The proposed east base site, located yesterday on the southern side of Neny Fjord in Marguerite Bay, was found this morning to be completely blocked by ice pack, stated a report made public here today by the Antarctic Service.

"Another site, that appeared from the aerial photographs to be a possibility, and lay to the southward of Red Rock Ridge Peninsula, was also found to have been blocked with ice since inspected from the plane.

"Rear Admiral Byrd and Base Leader Black then found it necessary to make another exploratory flight in seaplane. They took the air from 4 to 6 o'clock this afternoon and the coastline was again thoroughly inspected.

"Two small islands were seen about a mile and a half north of Neny Island either of which appeared to be possible locations for bases. A glacier, part of which was so smooth that it resembled barrier surface, extended down to the islands.

"Those islands will be examined by motor launch at daybreak tomorrow to check as to their suitability for the establishment of the east base."

Quoting a radio dispatch from the expedition, the report continued:

"The U. S. S. Bear's motor launch has been sounding all day to attempt to find an anchorage that would be safe from ice, wind and waves.

"The whole eastern end of Horseshoe Bay was thus inspected, with the result that we have at last apparently found a protected anchorage behind some low-lying islands in the southeastern portion of the bay. The Bear is now anchored behind these islands.

"There are many shoals in this vicinity, but we think that by use of the plane and motor launch we have them all spotted so that the ship will be able to avoid running aground.

"Until this anchorage was found there was considerable uncertainty as to what would happen to ships in a snowstorm where visibility would be cut down to zero. The airplane flights have shown that there are hundreds of uncharted shoal spots in this area.

"Several storm lanterns have been placed on islands near the anchorage so that, in case the ice forces the ship to move its anchorage, manoeuvring can be accomplished on a known line of bearing.

"The weather is calm tonight, which is a relief to all hands. The North Star is anchored behind Neny Island."

BYRD'S AIDES BEGIN ON ANTARCTIC CAMP

Unloading Operations Start at Eastern Base

WASHINGTON, March 13—Unloading operations have begun at the eastern base of the United States Antarctic Service, the navy has been informed in a radiogram from Admiral Byrd. The message, dated Monday, read in part:

"The motorship North Star lies anchored off the coast of Palmer Land today, discharging cargo for the United States Antarctic Service's eastermost base. The base site, spotted by Rear Admiral Richard E. Byrd and Richard Black, in a plane flight from the vicinity of Red Rock Ridge last Friday, lies on a small rocky island in Marguerite Bay in the vicinity of Neny Island. It is south of a camp established by John Rymill, an English explorer, in 1936.

From the air Rymill's cabin, free of snow and apparently intact, and a cache of neatly stacked boxes were sighted.

A shore party comprised of Richard Black, Finn Ronne, Fred G. Dustin, Robert Palmer, Donald Hilton, William A. Pullen and Roger Hawthorne tramped across a mile of thin bay ice Friday night to make a preliminary survey of the site.

"Unloading operations did not begin until today, however, because an off-shore 72-mile an hour wind, which at times reached a velocity of between 90 and 100 miles per hour, kept the North Star riding at two anchors in Neny Fjord from early Saturday until late last night.

"The expedition vessel reached the island only after its launch found a narrow channel between Neny Island and one of the many icebergs which block entrance to the bay.

"The Bear, which rode out the storm in a reef-protected cove at Horseshoe Island, anchored late today 400 yards off the east base site to assist in establishment of the Winter camp."

BYRD PARTY FIGHTS GALE AT NEW BASE

Landing of Supplies Is Slowed Up by 65-Mile-an-Hour Blow

WASHINGTON, March 19—The United States Antarctic expedition personnel, now engaged in the establishment of an eastern base in the Marguerite Bay area, was battling a sixty-five-mile-an-hour gale yesterday, which slowed up the landing of supplies. Five members of the base party were reported isolated on a small island, but were apparently in no danger. The message from the expedition read:

"A southeasterly gale whipping across Marguerite Bay, Palmer Land, abruptly halted unloading operations today at the United States Antarctic Service's eastern base. The wind, which at times reached velocity of sixty-five miles per hour, struck early yesterday as members of the expedition and crews of the U. S. motor ship North Star and U. S. Bear were preparing to lighter ashore the last 150 tons of Winter supplies remaining aboard the North Star.

"Isolated at the small island camp were Herwil H. Bryant, Harry Darlington, Donald C. Hilton, Elmer L. Lamplugh and Lytton C. Musselman. Although the shore party possibly suffered some discomfort, it had an ample supply of food, fuel and sleeping bags. Two firmly secured tents and the cabin of the expedition's transport plane provided adequate shelter and, with their portable radio set, the men messaged, 'Everything okay.'

"Straining at two anchors a mile off shore, the North Star easily held her own against the gale. Three times she had to get under way to avoid drifting icebergs, but her two two-ton anchors held securely on the bay's rocky bottom.

"Taking advantage of their enforced inactivity members of the ice party and crew got their first real rest since March 12, when unloading operations began. All hands, including twelve bluejackets from the Bear, have been working from twelve to fourteen hours daily transferring cargo from ship to shore by lighter—a tedious operation.

"The major part of the supplies have been hauled to the camp site by tractor and the foundation and floor of the base's main building already have been ompleted. Given favorable conditions, all cargo remaining aboard the North Star, including 2,000 hundred-pound bags of coal, should be gotten ashore in two more work days. The flagship Bear, which has been anchored in Horseshoe Bay since last Thursday, will need only one day on her return to Neny Island for discharging cargo and refueling."

The Polar Times

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THE GERMAN ANTARCTIC EXPEDITION OF 1938-39

This expedition has been covered scantily in scattered news items, but the best account is that in *Petermann's Mitteilungen* for June 1939, though there was a D. N. B. account released April 11, 1939 which has been translated in the *Geographical Journal* of January 1940. The expedition was made in the motorship *Schwabenland* (Capt. Alfred Ritscher) equipped with two ten-ton seaplanes and a catapulting device. The ship remained off the Antarctic coast for a period of three weeks and carried out three flights into the hinterland. The area of these explorations lies between the meridians of 11½° W and 20° E. From the southern margin, which was said to be of an altitude of 4,000 metres, the inland ice was seen rising in the direction of the Pole. In the middle of the area seen was a high mountain mass with lofty peaks. The edge of the polar icecap where seen was found to have its northern limit between 2° E and 8-10° W, was characterized by precipitous northern slopes and was followed southward from 73½° S to 74° S. The territory seen is said to have an area of 600,000 sq. ki., of which something more than half was photographed from the air. This territory was taken possession of for the Third Reich.

1938 OXFORD UNIVERSITY GREENLAND EXPEDITION

This expedition, the third of a series, had as its objective the investigation of the little-known country lying between the Sondre Stromfjord and the Evigheids Fjord of southwest Greenland—an area which lies immediately south and west of that studied by some of the University of Michigan expeditions.

On the 1936 expedition it had been learned that the great Knud Rasmussen ice arm which pushes out from the inland ice to the westward south of the Sondre Stromfjord, now has its tip separated by a narrow belt northeast of the Evigheids Fjord. This separated tip the expedition has christened the Sukkertoppen (Sugarloaf) icecap. The work of the expedition of 1938 consisted chiefly of cartographic, meteorological and glaciological studies of Taterat Glacier, which is a small outlet glacier descending to the Evigheids Fjord from the Sukkertoppen icecap.

BRITISH CANADIAN ARCTIC EXPEDITION

This expedition was carried out in 1936 and 1937, and certain of its members appear to be still in the north. T. H. Manning, the leader, has already spent some time on Southampton Island (northern Hudson Bay), and had begun a map of its coast. The main object of the present expedition has been to complete surveys of Southampton Island and those of neighboring shores, particularly those of Frozen Strait. The winter was spent at a Hudson Bay Company's post, and the summer journeys carried out with use of a whaleboat furnished with sails — *Geographical Journal* Feb. 1940).

—Prof. William H. Hobbs
Ann Arbor, Mich.

Warmth for Antarctica

If Dr. H. Landsberg of Pennsylvania State College had his way he would do something about the ice-covered regions of the earth, especially Antarctica, which, explorers agree, has rich mineral resources. He would simply spread coal dust and melt the snow.

This startling conclusion is based on some experiments made in three Winters and described in detail before the last meeting of the American Meteorological Society. Dr. Landsberg found that so thin a cover of coal dust as 0.5 millimeter (0.02 of an inch) will reflect less than 10 per cent of the energy received from the sun. On days when the temperature was slightly above freezing ice blocks measuring a square centimeter (0.155 square inch) melted completely in four hours, but uncovered blocks were still 85 per cent intact. Even after ten hours, with temperatures above freezing, 37 per cent of the uncovered blocks (by weight) remained. On calm, sunny days, with air temperatures as low as 20 degrees Fahrenheit dust-covered blocks lost 5 per cent of their weight in two hours. On sunny days when the air temperature was continuously below freezing that of a snow surface covered by black dust was raised five degrees above that of uncovered snow roundabout.

Dr. Landsberg calculates that in a single polar Summer the solar radiation that falls on each square mile of ice and snow is equivalent in its heating effect to 4,000 tons of burning coal. Realizing the difficulty of tampering with Antarctica on any impressive scale he would begin with glaciers which now cover vast territories. "The glacier at the upper end of a valley is locally the breeding ground of cold air that affects the lower parts of the valley," he explains. If it were blackened its reflecting power would be greatly reduced and local weather and climate influenced.

Since there is much talk about Lebensraum these days Dr. Landsberg wonders "whether it would not be worth while to recover some land from the 'eternal' ice fields." Cold winds from glaciers now reduce the growing season of the valleys by more than 10 per cent and often mark the altitude at which vegetables and trees will grow. If you want to begin at home, suggests Dr. Landsberg, spread coal dust over icy roads and let the sun do the rest.

ENVISIONS RETURN OF GLACIAL EPOCH

British Scientist Suggests the Paradox of Ice Ages Occurring as Sun's Heat Increases

WASHINGTON, Dec. 23—Evidence of the formation and breaking up of glaciers in the geological period just preceding the present one indicates that we are living in a cold, dry epoch that will probably be succeeded by one in which glaciers thousands of feet thick will again scour the temperate zones from the polar regions, Sir George Simpson, British meteorologist, reported today.

Writing in the annual report of the Smithsonian Institution, Sir George advanced the paradoxical theory that ice ages occur as the sun gets progressively hotter. This, he said, might explain the ice age of thousands of years ago when glaciers moved from Greenland over the northern parts of Europe and America, and might classify the present era in the cycle of glacial epochs.

It is now generally accepted by astronomers that the sun is a variable star and its radiation output which heats the earth undergoes periodic ebbs and surges, Sir George states in his explanation. This does not indicate that an ice age results when the solar temperature sinks so low that an excess of ice would be formed in the polar regions, for the actual pattern is too complex for so simple an explanation, he says.

Greater Heat Ebb Required

The simple explanation would require a greater decline in solar heat than astronomers believe had occurred, he asserts. Furthermore it would have had to affect the whole earth and it would not explain the advances and retreats of the ice during the four glaciations and three interglacial periods of the Pleistocene geological period, the one preceding the present.

As the sun gets hotter, Sir George believes, the increased evaporation of water from the seas causes increased cloudiness over the globe which results in more rain or snow. Snow piles up for millenniums on the Arctic and Antarctic land masses until glaciers are formed which start to flow northward and southward until they reach latitudes where normal Summer temperatures are enough to melt them.

A point would be reached where even the polar regions would be so warmed that the glacier-built progress would be arrested and the ice age would come to a rather abrupt end. Once the ice was cleared from the temperate zones they could be relatively warm. The solar ebb would set in and the whole process would be gone through again in reverse.

Eventually the critical temperature would be reached at which the ice would form again, but this would require a longer time for the building up of an ice age than while the sun was getting hotter.

The period between these two epochs would be short and hot, according to the British scientist's theory. Since the heat of the sun would continue to decline, precipitation would decrease and there would be no more ice-building in polar regions, no more movements to the temperate.

Eventally the point would be reached in temperate zones where the balance between ice accumulation in Winter and ice retreat in Summer would be reversed. Reaching its minimum, the solar heat would start to go up again, and at last precipitation would increase to the point of renewed glaciation. This would be a long, cold interglacial period.

"If the theory is correct, we now are living in a cold, dry epoch owing to the decrease of solar radiation from its last maximum," Sir George writes. "If the solar radiation again increases there will be another glacial epoch and our epoch will become a second cold, dry interglacial."

Peak 350 Miles Away Viewed by 'Curved Sight'

'True Mirage' Reported by Master of Peary Ship

PHILADELPHIA, Feb. 24 (AP).—A true story of "curved sight" and of a mountain seen with the naked eye at a distance of nearly 350 miles was told today at the American Philosophical Society's mid-winter meeting. It was hailed as the longest recorded distance that human sight has envisioned an object over the earth's surface from a ground level.

Narrator of the story was Capt. Robert A. Bartlett, master of the ship Roosevelt that carried Rear Admiral Robert E. Peary on his epochal trip to the North Pole in 1909 and who in recent years has made frequent voyages into the Arctic aboard his famous Morissey.

Midway between Greenland and Iceland last summer Capt. Bartlett and all members of his crew saw the snow-crowned summit of the Snaefellsjoekull, a peak towering approximately 7,000 feet above the southwestern shores of Iceland.

Capt. Bartlett said he ascertained that the peak then was between 335 and 350 miles distant. Under normal conditions, unless the observer is high in an airplane, the earth's curvature prevents a mountain of that height from being seen at a greater distance than ninety miles.

Professor William H. Hobbs, University of Michigan geologist who made a scientific report of the phenomenon, described it as a "true miracle."

Sound Absorbed by Snow

LONDON (Science Service)—The amazing ability of snow to absorb sound is reported by the British explorer G. Seligman in the science journal, Nature, published here. In an expedition to Jungfraujoch in the Alps, Seligman's party dug deep holes in snowdrifts to study the penetration of the sun's heat through the snow. "By the time this (digging) had reached a depth of about thirty-five feet it was impossible for those at the top to hear the words of the men working below, even if raised in a shout, and it became necessary to signal, even at this small depth, by means of a bell," the explorer reports.

Says the Antarctic Cold 'Starves' Glaciers in Dry Desert Climate

Dr. Gould Tells Philosophical Society on Wilkes Centenary That Erosion Dates Back Millions of Years

PHILADELPHIA, Feb. 23—The paradoxical view that glaciers in the Antarctic Circle are slowly "starving to death," not because the weather was too hot but because it was too cold, was presented to the American Philosophical Society tonight by Dr. Laurence M. Gould, who was senior scientist and second in command of the first Byrd Antarctic expedition.

Speaking at the society's mid-Winter meeting, devoted to a symposium on American polar exploration and a centenary celebration of the Wilkes exploring expedition, Dr. Gould asserted that glaciation in Antarctica preceded by millions of years the development of ice sheets elsewhere on the earth. He "guessed" that glacial erosion in the Antarctic regions dated back 15,000,000 to 25,000,000 years.

Dr. Gould attacked as "an untenable thesis" the idea that the great Pleistocene ice sheets of lower latitudes perhaps a million years ago and those of Antarctica "should have reached their culmination at about the same time."

"Long before climatic conditions had become sufficiently severe to produce ice sheets of continental dimensions in North America and Europe," he said, "they must have begun to affect Antarctic ice masses adversely.

"The starvation processes due to intense cold which now characterize the Antarctic mainland must have had their beginning in early Pleistocene if not earlier. Certain it is that the effective glacial erosion of Antarctica must have preceded the rest of the world of Pleistocene by a very great length of time."

Glaciers "Starve" for Snow

Dr. Gould, who now is Professor of Geology at Carleton College, said in his discussion of the "starvation" process affecting glaciers, they were not getting sufficient "nourishment," in the form of snow, to continue growth. Because of persistent low temperatures over the great inland ice sheet the maximum amount of water vapor the air could hold was always small. This meant that low precipitation was everywhere the rule in Antarctica.

"At Little America, on the Bay of Whales," the speaker said, "the annual snowfall was the equivalent of seven and one-half inches of water. Elsewhere under comparable conditions similar values have been found. It is only the reduced wastage due to low Summer temperatures which permits such a low annual precipitation to maintain glaciers. Antarctica is not only a cold desert but it is likewise a relatively dry one."

Captain Harold E. Saunders of the Navy Construction Corps, showing slides of the flight of Admiral Byrd to the South Pole and the exploration of Marie Byrd Land, stated that the explorer had been criticized for making his expeditions "unduly large, cumbersome, expensive, and complicated."

Calling that "a matter of judgment," the speaker said it could not be denied "that by successfully coordinating the dog team, the ski, the airplane and the tractor, along with a weather forecasting system, Admiral Byrd covered an enormous amount of territory and brought back a wealth of information which will be increasingly valuable in the years to come."

Claims of Wilkes Affirmed

Dr. William H. Hobbs, Professor Emeritus of Geology at the University of Michigan, whose controversies with English geographers over the Antarctic discoveries of Charles Wilkes a century ago have attracted much attention, had the satisfaction of informing the philosophical society that within six months the Australian Commonwealth had reversed the official position of the British Government and had given recognition to Wilkes's claims.

Just 100 years ago today Wilkes completed his exploration of what he believed to be 1,500 miles of coastline of an Antarctic continent and turned back toward Sydney. Professor Hobbs stated that Wilkes's chief critics had been Sir James Clark Ross, who led an expedition to the Antarctic in 1841, and Sir Douglas Mawson, twentieth-century explorer.

Sir Douglas in 1929-30, Dr. Hobbs said, sailed for eighty miles over a stretch which Wilkes, on his map, had designated as land. But, the speaker went on, Sir Douglas returned the very next year and sailed for a distance of 400 miles over "his own land."

The Australian Government, Professor Hobbs said, last September had designated Wilkes Land as lying between 102 and 136 degrees east longitude, although Mawson had affixed Wilkes's name to only a 5-degree stretch near longitude 134 degrees east, "which Mawson claimed 'had never before been seen' but which Wilkes believed he had discovered in these seas."

Culver

CHARLES WILKES

LIVING IN ARCTIC IS HELD FEASIBLE

Americans Can Hunt Needed Food and Get to Like It, Stefansson Declares

PHILADELPHIA, Feb. 24—Vilhjalmur Stefansson suggested to the American Philosophical Society today that it would be "interesting" to combine Soviet conclusions that there is "life all over the Polar Sea" with American methods of exploration.

Soviet explorers, he said, by making twenty-three descents on the ice with some of the biggest land planes in existence had proved that planes of any type could be taken "anywhere over the Polar Sea." American explorers, he added, had shown that it was possible to live off the land in the Arctic regions wherever game was to be found.

With game apparently available over a wide expanse of the Polar Sea, he contended, it would be "much more comfortable" for exploring parties to take up semi-permanent abode at predetermined spots north of Alaska and west of Canadian islands and live by hunting rather than use the "European style" of exploration adopted by the Russians.

Picturing life in the Arctic Circle, especially during the Winter, as highly attractive, with some modification, Mr. Stefansson said that American youth of the Boy Scout type could be taught in a day to build a snow house. In five or six weeks, he added, they could build one as good as those of the Eskimos.

"Our men nearly always liked the life there—after they had two or more years of it," the explorer said. "You don't tire of the food, even if it is all meat.

"You enjoy it awhile, then stop eating, then eat under protest for a few weeks and after five or six months you have no longing for other food, except a sentimental longing, such as an American living in Europe might have for corn on the cob or strawberry shortcake."

Mr. Stefansson suggested that landing parties of "intelligent men" could be recruited with all sciences represented, and that during their life in the Arctic areas they could do scientific investigation with safety because planes could be sent to their aid if radio reports of illness were received.

Asserting that Sir Hubert Wilkins had flown 11,000 miles over the Polar Sea when daylight was "negligible," he called the method he advocated "practicable and inexpensive."

The speaker digressed momentarily to the European war situation when he said that in a country where Summer was "notably longer" than Winter the people preferred Summer and had a Summer economy, whereas the reverse was true when Winter was "notably longer" than Summer.

That, he said, was why there now was activity on the Finnish front "whether the Soviets are advancing or retreating."

Bob Bartlett Prefers Seal

Life in the Arctic was applauded also by Captain Robert (Bob) Bartlett, who said he "wouldn't trade a piece of seal meat for any damn porterhouse steak going."

Captain Bartlett, who was chief assistant to Admiral Robert A. Peary, discussed the explorations of Peary culminating in his attainment of the North Pole. Hugh J. Lee of Meriden, Conn., a companion of Peary on the crossing of Greeland in 1895, related his experiences.

The Arctic voyages and discoveries of De Haven, Kane and Hall were the subject of a paper by Professor W. Elmer Ekblaw, scientist of MacMillan's four-year Arctic expedition, and the saga of the two-year drift of the exploring ship Jeannette in the Arctic sea was related by Commander Edward Ellsberg of the Naval Reserve.

Dr. Earle P. Perkins of Rutgers University, zoologist of the second Byrd Antarctic expedition, showing movies of animal life in the Antarctic, said the inland continent appeared devoid of life and that on the ice floes, fast sea ice and the barrier shutting off most of the land area from the sea were found the "significant and characteristic life" seals and penquins.

Black rocks exposed through glacial ice absorbed enough heat during the period when the sun was highest, he said, to melt snow and form pools of water, in which a cycle of plant life was begun with algae. It was difficult for a species of marine life to gain a start under the Antarctic ice floes, he added, "but once it has gained entry, it becomes tremendously numerous due to the abundant food supply and few enemies."

How Lincoln Ellsworth's flight in 1935 demonstrated the peninsular nature of Palmer Land in Antarctica was related by W. L. G. Joerg, chief of the division of maps and charts in the national archives.

Claims to Area Stir Interest

Much interest was voiced by speakers and others in the possible preparations being made by the Federal Government to join the other nations now laying claim to overlapping parts of Antarctica. With Great Britain, France, Norway and Germany formally claiming it, this country, in spite of Wilkes's discovery of the continent, has never made any such move, although the present Byrd expedition is regarded as a step in that direction. Through Admiral Byrd and Lincoln Ellsworth the United States might be classed as an informal claimant, along with Japan, Belgium and Argentina.

Whaling Ship Frango Converted Into Tanker

The American whaling ship Frango, recently sold by the American Whaling Company, of New York, to the Frango Corporation of Panama City, Panama, has been renamed Clifford and is now being converted into an ordinary tanker, it was learned Feb. 17.

The Frango was one of the only two whalers still operating under the American flag. She is a vessel of 6,400 gross tons and was built by the Chester Shipbuilding Company, of Chester, Pa., in 1917.

The ship made only one trip to the Antarctic whaling rounds for the American Whaling Company.

The other American Whaler is the Ulysses owned by the Western Operating Corporation also of New York.

U. S. Claims to Antarctica Traced to Landfall in 1820

By Herbert B. Nichols

Natural Science Editor of The Christian Science Monitor

PHILADELPHIA, Feb. 23—United States claims in Antarctica are still a minor storm center in international politics. They seem to be more closely substantiated than ever today with Rear Admiral Richard E. Byrd continuing "on-the-spot" reconnaissance while here in Philadelphia naval officers, Government officials, and scholars review new and old evidence upon which American claims rest.

Lauding Admiral Byrd as the "young modern" of polar explorers, Capt. Harold Saunders, U. S. N., credited him with being the first to realize the great value of the radio and the aerial-mapping camera to polar exploration, also as the one "who co-ordinated the ski, sledge dog, airplane, and tractor successfully and established a weather forecasting system there, made possible by radio so that enormous areas could be tapped, mapped and searched for new scientific data.

"The publicity attending the polar flight in 1929 has overshadowed Byrd's most important contribution to our knowledge of Antarctic geography. A second flight to the northeast of Little America on Dec. 5, 1929, disclosed the Edsel Ford Mountains, which were seen after only 50 miles of flying beyond the known land. In a mere eight hours of flying Byrd added to the map of the world Marie Byrd Land and a massive mountain range."

Naval Records Quoted

Captain Saunders then quoted naval records of other major sledge and tractor expeditions by Admiral Byrd or his men which yielded results upon which America's claims to discovery and occupany are based.

The occasion for the present meetings of the American Philosophical Society was celebration of the 100th anniversary of Lieut. Charles Wilkes' discovery that Antartica really existed. It had been reported some years earlier by a Yankee sea captain.

It had long been suspected but never proved. Magellan thought Tierra del Fuego part of it, and when Australia was found, it, too, was vaguely extended through the South Pole. But Antarctica as a continent in its own right is still a youth of one century, the child of the United States exploring expedition of 1838-40.

As Captain Bryan of the United States Navy Hydrographic Office explained, new whaling grounds found in southern waters after the War of 1812, brought demands upon the Government for charts and information which did not exist. After many delays and intense opposition from the naval officers then thought best equipped to handle the assignment, 83 officers and 342 enlisted men sailed under Lieutenant Wilkes. Reduced appropriations necessitated using regular naval ships, far from satisfactory for polar climate. Clothing, too, was insufficient.

The work of Wilkes in Antartica is not well known today. In fact, lists compiled of the major expeditions there often omit his name. Geographers and scholars almost alone are responsible for remembering him, yet for years they marked his discoveries with question marks. Not only were his discoveries questioned and attacked when he returned, but he was courtmartialed as well. Now it is established he was one of our greatest explorers, resourceful and daring.

With recent maps of the South Pole's "land of the freeze and home of the blizzard" spread before them, men whose names have long been associated with Arctic and Antarctic exploration reminisced on past adventures.

William Hobbs, professor emeritus of geology at the University of Michigan, veteran of many Philosophical Society meetings, drew a close distinction between the series of landfalls mapped by Wilkes in 1840, "entitling him," he said "to the honor of having been the first to prove a continental character," and the discovery of Antarctica "made 20 years earlier by Nathaniel Palmer, Yankee skipper of the sloop Hero."

Presenting maps and writings now in the Library of Congress, Col. Lawrence Martin, Chief of the Division of Maps, substantiated Professor Hobbs' statement that Palmer had been the first to discover the Antarctic mainland. "His landfalls were not limited to the coast visited Nov. 18, 1820 at 63 degrees 45' S. and 60 degrees 10' W," said Colonel Martin, "for in January, 1821, this Stonington, Conn., sealer traced the border of Antarctica southwestward to Marguerite Bay in 68 degrees south latitude, thus demonstrating at the outset that there was continuous land for 450 miles or more beyond his initial landfall."

British Captain Quoted

Referring to British claims to Palmer's Land or Graham Land as it is called on many charts, the Chief of Maps said "on Feb. 4, 1832, John Biscoe of the British Brig Tula was 1,000 miles west of this peninsula and referred to the difficulties in case he should 'find any land in the neighborhood of Palmer's Land.'"

"In 1833, the Royal Geographical Society of London proposed that the coast from Adelaide Island to Anvers Island, seen by Biscoe the year before, be called Graham's Land, a name sometimes applied erroneously to the whole peninsula.

"The evidence that in 1821, 11 years before Biscoe, Palmer discovered Graham Land, as well as most of the remainder of the west coast of the Antarctic peninsula which properly bears Palmer's name, includes a group of manuscripts and logbooks in the Library of Congress.

Wilkes, too, referred to that portion of Antarctica as Palmer's land, Colonel Martin asserted.

F. W. Reichelderfer, Chief of the United States Weather Bureau, reviewing Wilkes' contributions to terrestial magnetism, gravity, and meteorology, pointed out that at that time there were no daily weather maps and even the data that Lieutenant Wilkes was able to add served well at a time when systematic weather observations were just being started. Ideas then were centered largely around statistical averages. For example, if it had snowed more often than it had been clear on past Feb.24, then the next Feb. 24 would be snowy.

Hugh J. Lee (left), who accompanied Robert E. Peary on expenditions to Greenland before Peary traveled up to the North Pole, points out familiar places during a symposium on Polar exploration at the American Philosophical Society. The ice lovers with him are W. Elmer Ekblaw, scientist on Commander Donald B. MacMillan's four-year Arctic expedition; Mrs. Marie Stafford, daughter of Peary, born in Greenland, and Junius Bird, of the American Museum of Natural History.

Present Value Of Antarctica Is Minimized

By Herbert B. Nichols
Natural Science Editor of The Christian Science Monitor

PHILADELPHIA, Feb. 24—To forsee any economic value to ownership of land in Antarctica within the next generation or two is "wishful thinking," Dr. Laurence M. Gould, senior natural scientist and second in command of the first Byrd Expedition, told members of the American Philosophical Society here today.

"The Antarctic continent is not like Alaska," he said. "No ore deposits of any great consequence have yet been found. Prospecting for petroleum yields poor results, and though there are large deposits of coal known and suspected, it is of poor quality."

Dr. Gould made a special study of the glaciers of the Antarctic while he was there, and this was the subject of his formal lecture last night. He said his first love for ice came rather abruptly while he was studying law in college. A course in geology upset his plans to become a lawyer. Since then his search for glaciers has taken him to major ice masses at both ends of the earth and some more accessible. His plans now call for an invasion of little known ice fields in the South Andes sometime.

Present Importance

Questioned on the importance of the current United States Antarctic Expedition headed by Rear Admiral Richard E. Byrd, he said he felt the main reason for going there now was the obvious one, namely, to establish our title to lands discovered, through actual occupancy and use. Admiral Byrd has already reached Little America where headquarters and Weather Station Number One have been established. Another will be built on the opposite side of the Continent in Palmers Land.

"It is intended to make these settlements or stations permanent," he said, "not alone to prove the United States' interest in her Antarctic claims, but to more carefully survey the land, continue the search for possible economic values, and pursue studies of the weather. There is little doubt but what the key to earth's weather on a long range basis, lies in the polar regions."

Asked about the possibilities of future litigation over the maze of conflicting claims made by various Nations in the Antarctic, he replied that disputes were just beginning to flare up in earnest with several countries preparing to send official parties south before trouble broke out in Europe. "That gives the United States a temporary advantage at least," he concluded.

Honors for Wilkes

This mid-winter session of the Philosophical Society, America's oldest organization for the promotion of knowledge in the natural sciences, is being held to honor Lieut. Charles Wilkes, who led the first United States Navy Expedition to the Southern Ocean 100 years ago. Like the present expedition headed by Admiral Byrd, it was sponsored by the Government. Accompanied by a staff of nine natural scientists whose later contributions to knowledge added up to 19 technical volumes, Captain Wilkes visited Antarctica, mapped what was later named "Wilkes Land" in his honor, and established the fact that land of a continental nature lay south of 60.

FIRST PEARY POLAR TRIP DESCRIBED

Survivor Says Lost Food Cache in Early Hunt Delayed Discovery

Feb. 24

The North Pole might have been discovered earlier than 1909 by the late Admiral Robert E. Peary if a food supply he had cached in Greenland had not been snowed under and lost, according to Hugh J. Lee.

Lee, now city editor of the Meriden (Conn.) Morning Record, told of this episode today at the concluding sessions of a two-day celebration of a century of American polar exploration at the American Philosophical Society, 104 S. 5th st.

He accompanied Peary when the explorer made his first attempt to reach the North Pole in 1894-95 over the Greenland ice cap. The food supply had been stored 125 miles inland from their headquarters on Bowdoin Bay. It was marked by a 15-foot bamboo pole with a bright tin cracker box fastened to the top.

They planned to go by sled from the northeast coast of Greenland over the sea ice to the Pole, a distance of about 500 miles. But when they reached the coast, Lee said, they discovered they couldn't get down to the sea ice because of steep cliffs.

Snow Hampered Detour

If they could have renewed their supplies from the cache, they could have made a detour, he recalled, but the snow had wiped out all traces of the location of their supplies. And the two and one-half tons are still buried somewhere in the Greenland ice and snow and may turn up some day floating in an Atlantic iceberg, he added.

It was a race with starvation to get back to the base camp without these supplies. They started out with 41 dogs and returned with one, having eaten all those that didn't die naturally. They encountered temperatures of 61 degrees below zero and wind velocity for a day and a half of an average of 48 miles an hour.

If they had found their supplies and had been able to go on, they would have discovered what Peary did not find out until 1905—that it was impossible to reach the Pole by way of the sea ice, northeast of Greenland, because of the current which sent it drifting south faster than men could travel over it by sled, Lee explained.

Peary probably would have transferred his attempts to reach the Pole earlier to the vicinity of Grant Land, from which he made his final successful try, he continued. As it was, Peary led other expeditions to reach the sea ice north of Greenland before he discovered that he couldn't cross it to the Pole.

Arctic Mirages Increase Polar Research Problems

By the Natural Science Editor of The Christian Science Monitor

PHILADELPHIA, Feb. 26 — The story of islands and mountains seen above the Arctic Circle in places where no land exists, added mystery to the tales of Arctic exploration told before the American Philosophical Society's mid-winter meeting held in celebration of the 100th Anniversary of Lieut. Charles Wilkes' discovery of the Antarctic Continent.

Captain "Bob" Bartlett, Commander of the Arctic Ship Roosevelt and Rear Admiral Robert E. Peary's principal assistant on his final voyage to the Pole in 1909, told the Society mirages in the Arctic are as common, if not more common, than in desert regions. They are caused by the same phenomenon, alternating layers of hot and cold air in the atmosphere which distort or refract light rays causing them to travel a zig zag path instead of a straight one. Many an island or peninsula was charted by early Arctic mariners based upon mirages, while later explorers in search of them turned up nothing but sea or floating ice.

Early Polar Theories

Commander Edward Ellsberg, author of the Saga of the Jeannette, likewise told a story of Arctic mirage and how Wrangell Land, mapped as a large island possibly extending to the Pole, turned out to be an insignificant "speck."

That the North Pole was a spot over the ocean was wholly unknown in the last century, Commander Ellsberg said, and theories which now seem absurd were then given wide credence.

"Every attempt to reach the North Pole by the Atlantic seas had been effectually blocked by ice which ships could not penetrate. But there were current in polar circles the doctrines that through Behring Strait a direct approach might be made by way of the Kuro-Si-Wo or Japan Current, supposed to sweep northward through the Arctic Ocean giving perhaps an ice-free channel to the Pole. Even if blocked finally by ice, it was thought her crew might sledge the rest of the way north along the coast of Wrangel Land."

That was why James Gordon Bennett of the New York Herald outfitted the U. S. S. Jeannette in 1879, which set out under command of Lieut. George Washington De Long from San Francisco. But less than a week after passing through Behring Strait, the Kuro-Si-Wo Current theory was exploded. The Jeannette froze solidly in the Arctic ice pack near Herald Island. Then a few weeks later the second theory upon which the expedition rested its hopes, likewise faded when it was found that Wrangell Land was only an insignificant island reaching nowhere near the Pole.

Saga of Jeannette

Commander Ellsberg told again the Sage of the Jeannette, how the expedition drifted helplessly for nearly two years in the Arctic ice pack, drifted northwest until in July, 1881, when the ship was crushed by polar ice and sank, some 500 miles north of the Lena Delta, leaving the crew of 33 in desperate straits.

How the castaways trekked by sledge and boat across 500 miles of tumbling ice pack and Arctic seas is a story never excelled before or since by Arctic explorers. Lieutenant De Long brought his men safely through to the coast of Siberia, only to perish there of hunger and cold when supposed outposts of civilization mapped along the Delta, turned out to be deserted.

Only Lieutenant George W. Melville, his engineer, and twelve men that were with him, won through to safety, bringing back with them the results of the Jeannette's discoveries and the first exact knowledge of the polar seas and currents north of Siberia. Upon this data Nansen's famous voyage in the Fram was based.

Two Philadelphians were among the scientists in the Wilkes expedition, the first Antarctic exploring party sent out by the United States, a century ago.

Titian Peale, a son of the famous artist, Charles Willson Peale, who painted George Washington's first portrait, and Charles Pickering were the Philadelphians who spent four years with the Wilkes expedition. Both were members of the American Philosophical Society.

Dr. Edwin G. Conklin, vice president of the society, described Titian Peale as "a prima donna with an artist's temperament, who offended Navy brass hats and for this had the book on ornithology which he wrote following the expedition suppressed by the Government." This book is extremely rare and scientifically valuable. A copy is in the possession of the society.

Dr. Conklin read excerpts from letters sent home by Peale, one of which described the holystoning and swabbing of the ship's decks as similar to the Saturday scrubbing of the doorsteps in Philadelphia. In another Peale stated that the reports of observers that 71 meteors fell in a given hour were exaggerated and most of the meteors they thought they saw were caused by the rolling of the ship.

Three great grandchildren and two great-great grandchildren of Captain Charles Wilkes, who led the expedition, are attending the celebration

EXPLORERS CLUB NAMES ROOSEVELT

Stefansson Praises Selection of Byrd to Continue His Antarctic Studies

President Roosevelt was named an associate life member of the Explorers Club, and Lord Tweedsmuir, Governor-General of Canada, was pressented with the club's scroll of honor at the thirty-sixth annual dinner of the organization at the Hotel Plaza Jan. 6

Dr. Waldo L. Schmitt, marine biologist of the Smithsonian Institution, Washington, who accompanied Mr. Roosevelt on his cruise in 1938 to the Galapagos, where a new palm tree, Rooseveltia Frankliniana, was discovered, was presetn to receive the scroll of associate membership in behalf of the President.

Lord Tweedsmuir became the second person to receive the club's scroll or honor and title of Patron of Exploration. The first recipient of this distinction was John D. Rockefeller. Loring C. Christie, Minister of Canada, accepted the scroll in behalf of the Canadian Governor-General.

Lord Tweedsmuir was named as a "Patron of Exploration," the citation explained, because of the service he has rendered to exploration in his writings under his name of John Buchan, and also because of the encouragement he has given to development of the Canadian Arctic. His family also long has been distinguished in exploration history.

Another award was made to Sir Hubert Wilkins, explorer, who received the club's medal in recognition of the pioneer work he has done in the field of Arctic and Antarctic exploration by airplane and in Arctic meteorology.

Dr. Isaiah Bowman, president of Johns Hopkins University, Baltimore, was named an honorary life member of the club, joining a group of about twenty men who have been similarly honored in the past.

More than 400 members and guests who attended the annual dinner heard talks by a number of explorers, including a talk by Vilhjalmur Stefansson, retiring president of the club, on "The Year 1939 in Exploration." Dr. Herbert J. Spinden, who last night succeeded Mr. Stefansson as president of the club, presided, and Rockwell Kent was toastmaster.

In his address, Mr. Stefansson named as the outstanding event of the year in the field of exploration the selection of Admiral Richard E. Byrd to continue the investigation of the Antarctic by the United States. The Soviet Union, he said, carried on the most notable work in Arctic exploration during 1939, but he expressed the fear that further attempts to fill in the blank spaces of the map may now become "a casualty of the war."

Dr. John K. Wright, director of the American Geographical Society, received the honorary life membership in the club in behalf of Dr. Bowman. It was explained that the award af associate life membership to President Roosevelt was made in recognition of his personal encouragement of exploration and his backing of the Byrd Antarctic expedition.

Bumstead Dies; Cartographer, 64, Aided Byrd

Invented Compass Without Which Explorer 'Could Not Have Reached Pole'

WASHINGTON, Jan. 9—Albert H. Bumstead, for twenty-five years chief cartographer of the National Geographic Society, died today at his home here. He was sixty-four years old.

Mr. Bumstead was the inventor of the Bumstead sun compass, a device he constructed especially for Rear Admiral Richard E. Byrd for his flight over the North Pole in 1925. Without that compass, Admiral Byrd said, his expedition could not have reached the pole, and it "is doubtful if we could have hit Spitzbergen on our return flight."

The sun compass was necessary because a magnetic compass plays strange tricks in polar regions. It is a remarkably simple device, based on the principle that the sun circles the pole once in twenty-four hours. The compass, built like a clock with a twenty-four-hour dial with only a single hour hand, automatically points to the Greenwich meridian when the hour hand is pointed to the sun. Admiral Byrd also used the compass on his Antarctic expenditions and named a peak in the Queen Maud Range near the South Pole in Mr. Bumstead's honor.

Mr. Bumstead also aided Admiral Byrd in preparing for his trans-Atlantic flight, helping him to plot his course along the "great circle" route.

SIR G. L. EGERTON, ARCTIC EXPLORER

Admiral, Who as Young Man in 1875 Was With North Pole Expedition, Dies at 87

LONDON, March 31—The death on Saturday of Admiral Sir George Le Clerc Egerton, last surviving member of the 1875-76 Arctic expedition, was reported today. He was 87 years old.

Sir George was a sublieutenant on the Alert, which was caught in the ice at Cape Sheridan for thirteen months while the crew wintered 400 miles from the North Pole. He died at his home, Manor House, Ringwood, Hants.

Sir George Egerton, K. C. B., C. B., was born on Oct. 17, 1852, and entered the navy in 1866. He became a captain in 1893. He was a naval attaché to various European countries, and for his participation in the arctic expedition of 1875-76, received the Arctic Medal. He served with the Naval Brigade at Mombasa in 1895 and was present at the bombardment and capture of Zanzibar's palace the following year. He was a member of the Benin expedition in 1897, and was frequently mentioned in dispatches.

Richard Hayward Taylor

Retired Sea Captain, Who Sailed With Admiral Peary, Dies at 80

RICHELIEU, Quebec, Jan. 4 (CP).—Richard Hayward Taylor, retired sea captain, who sailed Arctic waters with Admiral Robert E. Peary, Polar explorer, died here today. He was eighty years old.

Mr. Taylor's career as a seafaring man started when he was nineteen. He joined Admiral Peary after having commanded his own ships for several years. Later, he joined the Hudson's Bay Company and became skipper of the Fort York, the vessel which distributed provisions brought north by the Canadian government ship Nascopie.

Dr. John H. Finley

NEW YORK, March 7 (U.P.). Dr. John Huston Finley, 76, editor emeritus of the New York Times, author and educator, died today in his sleep at his home.

BALTIMORE, Md., March 7—The following statement by Dr. Isaiah Bowman, president of Johns Hopkins University, on the death of Dr. Finley was issued today:

"Through his warm personal interest and initiative, Dr. Finley created over a period of years the most valuable globe in the world. It is a priceless object, for it can never be duplicated. It is a modern library globe, now in the possession of the American Geographical Society of New York, upon which have been drawn the tracks of modern aviators who have spanned the continents and oceans and made the first planetary network of the air.

"The tracks are drawn in each instance by the aviator who flew the course, with the signature and date added. The earliest transatlantic crossings, the great Pacific flight, the South American circumnavigation, the trans-Siberian airship course steered by Eckner, Amundsen's airship flight across the Arctic Sea by way of the North Pole, Byrd, Wilkins, Lindbergh, Ellsworth—all the great flights and names are upon it.

"Dr. Finley carried the globe down to the wharf on several occasions in order to meet the homecoming explorer and get his signature and his route while the news was still fluid. He borrowed and returned it again and again. It is an extraordinary human document, not only because of the original signatures and tracks which it bears, but also because it represents Dr. Finley's creative interest in geography.

"When elected honorary president of the American Geographical Society, he had already earned the place. His introduction of returned explorers at the monthly meetings of the society drew large numbers of visitors who looked forward to his always original remarks.

"Dr. Finley's editorials on geographical subjects in THE NEW YORK TIMES were accurate and acceptable as scientific geography and they were also permeated with a driving imaginative quality peculiar to himself. His walk right around Manhattan Island in one day, an annual stint of thirty miles, always brought out glowing comment on newly discovered things.

"When he was Red Cross Commissioner in Palestine, he walked in a single moonlit night from the sea-coast to Jerusalem. He had the best pair of legs in New York. He had unbounded encouragement for explorers whose imaginations responded to his own, and an irrepressible boy's curiosity and eagerness for that which was new."

J. C. VAUGHAN DIES; SURGEON, EXPLORER

On One Arctic Expedition Ship Was Wrecked and Party Was Marooned 19 Months on Ice

Dr. John Colin Vaughan, surgeon and Arctic explorer, died at the New York Hospital early Jan. 12 at the age of 69.

In 1898, gold was discovered in Alaska and Dr. Vaughan, with several companions, set forth on the overland route across the Northwest territory to Alaska, at that time a daring attempt. Dr. Vaughan alone persevered, achieving one of the longest and most hazardous overland journeys up to that time in the Northwest.

For several months he engaged in placer-mining at the Nome beach before working with his pack train for the Hudson Bay Supply Company. In 1899 he became the official mail carrier between Dawson and Nome. He made the trip regularly, Summer and Winter, for two years.

In 1901, in the Yukon, he became acquainted with a San Francisco physician, who persuaded him to return East and study medicine, which he did, entering the College of Physicians and Surgeons in New York. At the end of the second year he joined the Ziegler expedition as second assistant surgeon and veterinary in charge of the dogs.

The expedition was gone twenty-seven months, nineteen of which it was marooned on the ice at Franz-Joseph Land after its vessel had been crushed in the ice.

After the rescue, he returned to his medical studies and in 1907 was graduated.

LORD TWEEDSMUIR

MONTREAL, Feb. 11. — Lord Tweedsmuir, Governor General of Canada since 1935, a noted author, who also had held other important posts in the British Empire, died here tonight, less than a week after suffering a brain concussion at his official residence in Ottawa. He was sixty-four years old.

GUSTAV HOLM

COPENHAGEN, March 13—Commander Gustav Holm, Danish polar explorer, died yesterday at the age of 90. He was known as the nestor of Arctic explorers.

Born in 1849, he celebrated his ninetieth birthday last year and at the time looked back on sixty years of explorations. His principal achievement was the founding of the Angmagsalik colony in Greenland.

CHARLES FULLERTON

DARTMOUTH, N. S., March 11 (UP)—Charles Fullerton, chief engineer of the polar rescue expedition for Robert Edwin Peary, discoverer of the North Pole, died here today at the age of 90.

Mr. Fullerton was assigned to the post of engineer on the Canadian Government steamer Arctic, which went into the far north in search of Peary.

Eskimos Live in Tranquillity Far From the Echoes of War

OTTAWA, Dec. 2 (CP)—With Canada at war there are some 7,000 ardent "pacifists" in the northern regions of the Dominion completely aloof from the war effort. The Eskimo population knows nothing about the war and historically is probably the world's most unwarlike race, according to two outstanding authorities on those northern people.

The eskimos, say Maj. D. L. McKeand, chief of the Dominion Government's annual Eastern Arctic Patrol, and the Rt. Rev. A. L. Fleming, Angelican Bishop of the Arctic, are survivors of the patriarcal age, and because they have no tribes, they have no nationalism.

Eskimo social economy is based on the family unit rather than on the tribal unit. Eskimos live in small groups, moving about the vast expanse of snow, ice, and tundra. Their quarrels are family disputes rather than clashes of rivalry between different tribes or different peoples. An Eskimo just doesn't understand war, and is a pacifist of temperament and tradition.

The war has little effect on the Eskimo. His natural habitat is unlikely to become a battlefield, since Arctic ice floes could defeat the most powerful navy, and Arctic blizzards, the intense cold and the shifting snowdrifts could rout an army. There is no forage for soldiers, no fuel to be had.

War touches the Eskimo hunter only in a way he cannot understand—economically. When he brings his fur catch to the white trader in wartime to exchange it for such necessaries as matches, rifle, ammunition, flour, and household goods, it is puzzling to him to find that he must give more furs than usual for fewer goods in return. He knows nothing of a wartime decline in world fur markets and a sharp increase in commodity prices.

At present, fur prices are holding up fairly well, while commodity prices are rising. Some distress might come to the Eskimo if the price of fur, his one stock in trade, should drop.

Eskimos hear little of the war. Some have radios, but mostly for the white man's music. News over the air in the white man's tongue means nothing, but if there are isolated Eskimos who want to enlist to fight for their King, it would be a long and lonely journey out of the Arctic to join up. Too, the Eskimo physique is adapted to the northland.

Wilkins Revives Project To Sail Under Arctic Ice

Hopes 'Pocket Submarine' Will Carry Him to North Pole

EDMONTON, Alta., March 30 (UP).—Sir Hubert Wilkins is at it again—this time with a "pocket submarine" he intends to sail under the Arctic ice to set up a weather station near the North Pole.

He plans to sail his tiny submarine from Fort McMurray, 200 miles north of Edmonton, through the rivers and lakes of northern Canada to the Arctic, and thence to a spot midway between the Alaskan coast and the North Pole.

The expedition would be the explorer's second attempt at Arctic exploration via the underwater route. His first endeavor, aimed at reaching the pole, failed in its objective almost a decade ago.

"I have been assured it will be possible to take the vessel down the Mackenzie, and I have practically completed arrangements here for its construction," said Sir Hubert in Edmonton.

Eskimos to Collect Eiderdown

OTTAWA (AP)—Fifteen hundred Eskimo families with little to do between the trapping and hunting seasons soon may be employed in a new industry, the collection of eiderdown. The Hudson's Bay company has leased from the Canadian Government an area embracing the southern coast line of Baffin Island and all the islands east from Cape Dorset to Pangnirtung, to be set aside as an eider duck field. Sanctuaries will be established. The 1,500 Eskimo families in the area will collect the duck's down for commercial sales.

Relics of Arctic Trip Found on Island

Relics of the American Arctic expedition of A. Fiala, which were found recently on Rudolf Island have been assigned to the Arctic Museum in Leningrad, Russia. Among them are a note in a tin box, a French Thermograph with a drum and clock mechanism, an iron medicine chest, an American flag, three diaries in English, an English porcelain plate, the plan of the party's dwelling house and the expedition's seal.

The Fiala expedition was completely unsuccessful in its attemp to reach the North Pole. Its ship sank in Teplitz Bay, Rudolph Island, and in 1905 the members of the party were rescued by the Norwegian steamer Terra Nova.

Alaskan Using Sled Will Count Eskimos

WASHINGTON, March 23—A lone white man will go by dog sled as soon as weather permits across the "roof of America" to count the Eskimos in Alaska as part of the 1940 census.

The enumerator chosen for the task is Jens H. Forshaug, native-born Alaskan, who is an agent in the Department of Commerce's reindeer division. The job will require several weeks.

Census-taking, already begun in Alaska, indicates that the population figure this year will exceed the high record of 64,356 established in 1910. Figures from thirty-seven districts indicate that returns are running about 30 per cent ahead of the last count, in 1929, when the total was 59,278.

Electric Light Plant in Igloo

An igloo with its own electric light plant is one of the sights at Aklavik, diminutive arctic settlement at the mouth of the Mackenzie in Canada's Northwest Territories, says an article in Natural History Magazine. The proud Eskimo owner of the plant tells his neighbors that he has the moon at his beck and call by simply turning a switch.

U. S. to Give Eskimos Reindeer To Keep Them Off Alaska Dole

NOME, Alaska, March 20 (AP).—The United States government is rapidly completing its program for making Alaska's natives, the Eskimos and Indians, independent of foreign food sources. The goal is nearing realization in the Federal project to make the native wards self-supporting by giving them reindeer which have become the property of white owners. Congress appropriated $785,000 for the purchases last summer.

Charles G. Burdick, former Assistant Civilian Conservation Corps director in Alaska and now heading the reindeer acquisition program, is on his final trip this week to close deals with white owners of reindeer.

Mr. Burdick, Attorney Edward C. Kelly and Sidney Rood, acting superintendent of reindeer, left here by plane to travel as far south as Dillingham, at the head of Nushagak Bay, Bering Sea, and along the Kushokwim River, touching at points where white owners live. Before he left Mr. Burdick declared "the final stage of the reindeer purchase is approaching, with remarkable co-operation on all points." He made no mention, however, of the outcome of a conference with Alfred J. Lomen, head of the Lomen Reindeer Corporation, largest white owners of reindeer in Alaska.

The average price paid for the animals thus far is $3 a head. When the purchase is completed, attention will be given to construction of cold-storage facilities, abattoirs, range cabins and corrals. The program is expected to be concluded early in June.

Of the half-million or more reindeer in Alaska, 180,000 are owned by forty-six whites and the remainder by 4,700 natives. Reindeer bought by the government will be turned over to natives who do not have any. They will be expected to increase their herds through breeding.

Delegate Anthony J. Dimond, of Alaska, has predicted that the program will "keep the Alaska natives off the dole." Natives became destitute, he said, as they lost their principal food supply.

PREHISTORIC ESKIMOS UNEARTHED IN ARCTIC

Archaeologists Find a Village Unlike Any of North Types

At Point Hope in Arctic Canada Danish and American archaeologists have dug their way into an Eskimo village unlike any they have ever seen, reports Science Service.

On the expedition were Dr. Froelich Rainey and Louis Giddings of the University of Alaska and Helge Larsen of the Danish National Museum.

At this place, now called Ipiutak, lived prehistoric Eskimos who conspicuously do not fit into the neat pattern of some five successive types of Eskimo culture that scientists have worked out.

These people had odd ideas of houses, by Eskimo standards. The expedition unearthed nine houses, finding them square or rectangular and made apparently of sod, with logs and poles for framework. No stone or whalebone such as Eskimo builders ordinarily used. No long, narrow entrance passage for protection from cold. And no lamps! Eskimo women have always seemed inseparable from their lamps, which served as cook stoves, furnaces, for lighting, melting snow, drying clothes, and other uses. But these Eskimos had instead a central hearth where they burned wood and oil.

About fifty kinds of implements lay in buried wreckage of the homes, and only half are characteristically Eskimo. The rest are new to Arctic science. These Eskimos used no slate for blades, contrary to Eskimo custom. Flint was their leading material for drills, knives and harpoon points. They had no pottery.

From style of decoration on their goods, these odd Eskimos belonged to the North in an early time. But their precise place in prehistory awaits a later decision.

REINDEER HERD THRIVES

Animals Transplanted From Alaska Do Well in Canada

Canada's reindeer herds roaming the Mackenzie River Delta region are thriving, promising successful outcome of the mass transplanting of these animals from Alaska. Ten years ago Canada purchased a herd of reindeer in Alaska. Five years later the reindeer arrived at the Mackenzie River and were liberated on Richards Island. The original herd doubled in size in the first three years, not counting 300 killed each year to furnish food and clothing for the herders, and meat for hospitals and schools near by.

Now a new herd has been located at Anderson River, about 160 miles east of Mackenzie River. The two herds number over 5,000, giving promise of a successful reindeer industry, owned and herded by Eskimos, with the scientific guidance of the administration of Canada's Northwest Territories.

Greenland Station Is Sold

OSLO, Norway, Jan. 26—The Norwegian Greenland station Micardbu today was sold by W. Knudsen to the Norwegian State. The station is unique, being the world's northernmost weather-report station. Pan-American Airways has long been interested in it.

ICEBREAKER STALIN FIGHTS ARCTIC GALES

Radio Tells of Struggle to Reach Sister Ship in Far North

MOSCOW, Dec. 16—The icebreaker Joseph Stalin, which sailed from Murmansk Thursday, is on the way to aid the icebreaker Sedoff. The latter reported Thursday she was at 82 degrees 57 minutes North Latitude, 6 degress 33 minutes East Longitude. The ships are drifting southward with a small deviation to the east.

MOSCOW, Dec. 26—Messages are now coming in by wireless from the icebreaker Joseph Stalin vividly describing her contest with bitter Winter storms on her Arctic voyage to reach the icebreaker Syedoff.

"On a pitch dark ship with all lanterns covered up against the storm, with the polar heavens continuously black, the crew was constantly drenched by cascades of icy water in a six-day struggle to prevent the sea from sweeping away deck cargo," said one message.

"Big iron tanks of fuel oil and other valuable cargo were swept away. When we changed our course, hoping to avoid a storm, we ran into a worse hurricane. This, combined with reports from the Syedoff that she was drifting due southward, necessitated our resuming our course toward the southern point of Spitzbergen."

With a list of 50 degrees, said one message, it was easier to sleep on the hard floor than in bunks. Many even of these experienced Arctic sailors were seasick.

"Nature varied the form of attack daily," it was stated. "A seven-point wind on the starboard suddenly gave way to a squall, racing a hundred kilometers an hour. Rain yielded to a whirling snowfall, enveloping the ship in an impenetrable blanket. Decks were covered with ice and the captain's bridge became an ice cave. Terrific waves tore at the forecastle, sweeping away heavy ladders.

"On Dec. 22 the storm ceased as we entered Greenland Sea. The path northward was closed with ten-point ice up to two and one-half meters thick.

"On Dec. 24 we stopped in the ice four hours for engine repairs.

"We maintain regular radio communication with the Syedoff, toward which our ship is steadily chopping its way."

Tonight it was reported a coaling ship was being loaded from the mines in Spitzbergen to refuel the Joseph Stalin.

Syedoff Crew 'Heroes of Soviet'

MOSCOW, Feb. 4 (AP)—The captain and fourteen members of the crew of the Russian icebreaker Syedoff, which drifted twenty-seven months in the Arctic ice, each received the title of hero of the Soviet Union today and 25,000 rubles. The Order of Lenin and the medal "gold star" was also conferred upon them. Commander Ivan Papanin, leader of the expedition which freed the Syedoff from the ice, and members of his crew, were also honored.

Deer on Canned Diet

Because of the difficulty of supplying Arctic moss, their regular diet, while they were being shown in Moscow, twenty reindeer were trained for several months to eat bread and concentrated foods before they left Murmansk in the Arctic.

Ship Two Years in Ice Makes Port

MOSCOW, Dec. 29—A radio message from the ice breaker Syedoff today reported that at noon on Tuesday ice on the port side of the ship began to crack and by evening there were 500 meters of clear water around the vessel.

At night new ice formed on the surface but there were gaps occasionally, denoting the movement of neighboring ice.

During the twenty-four hours from Wednesday to Thursday, the ship drifted 12.2 miles in a southerly direction, the speed making it difficult to establish hydrological stations.

MOSCOW, Jan. 3—The icebreaker Stalin has approached so close to the other Soviet icebreaker, Syedoff, as to be able to observe reflected light from the drifting vessel, which has been for two years in the Arctic. Today only thirty-five miles separated the two ships.

A radio message from the Syedoff, dated Jan. 1, says the speed of her drift had considerably increased under a west-northwest wind. She was then at 81 degrees 21 minutes North Latitude, 4 degrees 30 minutes East Longitude. The right side of the ship was frozen to solid ice; on the left side were 500 meters of clear water.

From March 21 to Dec. 2, 1939, the ship was in the midst of huge ice floes of thirty square miles separated by large water spaces. Since then the ice has been in continual movement. Whenever the wind changes new cracks and fresh grinding of ice on ice are noted.

MOSCOW, Jan. 6—The icebreaker Joseph Stalin is making very slow progress and is being held up by bitter weather and ice in efforts to advance toward the icebreaker Syedoff. Yesterday morning the distance between the two ships was twenty miles. The Stalin's projector's light is clearly visible to those aboard the Syedoff.

The Stalin is economizing on coal and supplies and waiting until a gap is revealed by movements of the ice before forging ahead at full steam.

Discovering a layer of fresh ice the captain turned northward, but soon the Stalin was again stuck fast in the packed ice.

MOSCOW, Jan. 10—As the icebreaker Syedoff lay within sight of deliverance from the ice that has surrounded without damaging her throughout the course of her two years' drifting, she suffered the first serious damage today, the ice having broken through her hull, according to a radio message received in Moscow tonight.

It said that this morning a machinist discovered the ship had sprung a leak, with water streaming into the engine room. A general alarm was sounded and the whole crew was called on to stand by while the hole was feverishly patched up by men standing for hours in icy water.

MOSCOW, Jan. 14

Tonight Ivan Papanin, chief of Polar exploration, from aboard the Stalin, broadcast that a few hours after the two ships met, the work of freeing the Syedoff from the ice had begun. The Stalin sent twenty-one members of her crew across the pack to the Syedoff, among them the correspondent for the Soviet newspapers, who had signed on as a stoker to get the story.

Mr. Papanin said the men were engaged in freeing the hull of the Syedoff, which was frozen into ice thirteen to seventeen feet thick. The Syedoff's rudder was being tested, but even if it were in order the Syedoff probably would be towed to port.

Coal, food, especially fresh fruit, and fresh water were transferred from the Stalin to the Syedoff. The Syedoff's men during the day saw a film that had been sent from Moscow.

Earlier the two crews gathered aboard the Stalin, where Mr. Papanin greeted the Syedoff's men and Captain Badigin of the Syedoff replied.

MOSCOW, Jan. 17—The towing out of the icebreaker Syedoff, which was met north of Spitsbergen Saturday by the icebreaker Joseph Stalin after drifting more than two years in the Polar ice, started this morning, the correspondent for Pravda or board the Stalin reported.

"To tow the Syedoff through the heavy ice packs and solid ice fields will be exceptionally difficult," he said. "No less serious will be the crossing through the stormy waters of the Greenland and Barents Seas. For this reason the steel towing cables are being prepared with care.

"Yesterday the pilots of the flagship icebreaker [the Stalin] began to inspect the hull and navigational equipment of the Syedoff. On the whole the hull of the ship has been preserved wonderfully well. The strong pressure of the ice only dented the hull on the starboard side and broke several anchor chains. But the force of the ice was so great that in the engine room steel struts across the hull were bent. All the navigational equipment of the Syedoff is in full order."

MOSCOW, Jan. 18—Efforts to displace the ice shell around the hull of the icebreaker Syedoff, first by trying to chop it off with the bow of the icebreaker Stalin, then by discharging warm water from the engine room upon the ice and finally using chemicals, which blew off the ice from the portside, causing the Syedoff to heel over sharply, were described in dispatches today.

As it proved impossible to disengage the ice from the starboard part of the hull, it was found necessary to shift the vessel's coal to ease the list. Then it was decided to try towing the Syedoff again. A 9-inch steel cable was linked between the Stalin and the Sydeoff and at 11 A. M. yesterday the two vessels began to move slowly through the ice-flows.

At 5:50 P. M. the lights of the freighter were sighted on the boundary of the icefield. At 6 P. M. the Stalin cast off from the Syedoff and broke a path through the ice for the Stalingrad; then returned, followed by the Stalingrad, which tied up between the two vessels and began coaling.

Soviet Icebreaker Freed After 26 Months' Drifting

MOSCOW, Jan. 13—The twenty-six months of isolation of the icebreaker Syedoff, during her historic drift amid the desolation of the Arctic ice ended today at noon when at 7 minutes past 12 o'clock the icebreaker Joseph Stalin reached her and the crews of the two vessels met. The historic meeting was briefly recorded in a flash telegram on the 6 P. M. broadcast today.

A long description of the significance of the vessel's drift was given by Ivan Papanin. He asserted that the value and results achieved considerably surpassed those of Fridtjok Nansen's expedition in the Fram and made a considerable addition to the results of the Soviet Union's North Pole expedition.

Despite the joyful occasion of the meeting of the two crews, it was stated, no time was lost in getting to work on preparing for the conduct of the Syedoff by the Joseph Stalin from the ice.

The point of release was given as near the eighty-first parallel between Greenland and Spitzbergen, which would place the two icebreakers about 630 miles from the North Pole.

The drift of the Syedoff began Oct. 23, 1937, when she broke her propeller in an ice jam off the north coast of Siberia.

SYEDOFF IS HOME AT LAST

Russian Icebreaker at Murmansk After 27-Month Odyssey

MOSCOW, Jan. 30 (AP)—A Soviet saga of the perpetual Arctic ice ended on a note of triumph today as the Northern Sea Route Administration reported to Joseph Stalin that the icebreaker Syedoff, blasted from the grip of polar floes, had been brought safely home after drifting at the top of the world for twenty-seven months.

The rescue was accomplished by the 11,000-ton icebreaker Joseph Stalin, after the Syedoff had been carried within 300 miles of the North Pole, a new record for ships, and then drifted slightly southward.

The Syedoff, in tow of the Joseph Stalin, came back to Murmansk last night, to a flood-lighted wharf, where relatives waited to greet the crew of sixteen.

MOSCOW ACCLAIMS THE SYEDOFF'S CREW

Men Rescued From Icebreaker Hailed as Conquering Heroes

MOSCOW, Feb. 2—The icebreaker Syedoff's crew arrived in Moscow today punctually, to be hailed as conquering heroes by Secretary Sherbakoff of the Moscow Communist Party, Marshal Simeon Budenny and cheering thousands as they drove through the city in the latest of Russian automobiles, called the Zis-102, to the Kremlin, where they were greeted by Joseph Stalin and members of the government and were guests of honor at a dinner.

Outside the railroad station there was a half-hour meeting at which Mr. Sherbakoff, Captain K. S. Badigan of the Sydeoff and Ivan Papanin, who accompanied the rescue party on the icebreaker Joseph Stalin, made speeches.

Scientific Summary of the SYEDOV

By PROF. N. N. ZUBOV

Predecessors of the Syedov: Fridtjof Nansen

TOO much cannot be said of the courage and endurance of the great explorers who have reached or attempted to reach the North Pole. But from the standpoint of full and systematic information about the Arctic regions, the three most important expeditions are: Nansen's in 1893-1896, on the *Fram,* the nine-months, ice-floe drift of the Papaninites in 1937-1938; and the drift of the ice-breaker *Syedov.*

The highest latitude reached by Nansen's expedition was 85° 56′. Nevertheless it was Nansen who literally discovered the Arctic Ocean in a scientific sense.

From Nansen's expedition, we learned that the Arctic Ocean is over 3,000 metres (9,840 feet) deep, and that warm Atlantic waters (offshoots of the Gulf Stream) flow deep and far into the central basin of the Arctic Ocean. His observations established the fundamental laws of the movement of ice in this basin and of the formation, development and breaking up of ocean ice. There is not a single aspect of the oceanography or geophysics of the Arctic Ocean in which Nansen did not make discoveries.

The Papanin Expedition

On May 21, 1937, four heavy planes landed the Papanin expedition on the ice. The Soviet polar explorers proceeded to assemble a splendidly equipped polar observatory on their floe. On June 6 the planes flew back to Bolshaya Zemlya leaving four courageous men to pass the winter on the ice—Papanin, Krenkel, Shirshov and Fyodorov. They spent 274 days on the ice, drifting from the North Pole to the eastern shores of Greenland, where, at 70° 54′ latitude and 19° 48′ longitude, the expedition was taken on board by the ice-breakers Taimyr and Murman.

The expedition of the *Fram* opened up the Arctic Ocean to science. The expedition of the four Papaninites, amplified Nansen's observations, in some cases making important corrections, and made a whole set of new observations, unrivalled in quantity and quality.

They made depth soundings along the entire course. They established laws governing the movement of the ice and of the ocean currents under the ice, which escaped Nansen's observations. Their findings refuted Nansen's hypothesis regarding the absence of life in the central part of the North Arctic Ocean. They carried out invaluable magnetic and gravimetric observations. Their meteorological observations facilitated the organization of the trans-Arctic flights of Chkalov and Gromov and caused revisions of hypotheses on the compositon of the atmosphere and the weather determinants in the central Arctic basin.

In contrast to the drifts of the *Fram* and the ice-floe North Pole Station, the drift of the *Syedov* was unplanned, and took her into regions never penetrated before by ship or plane.

Other circumstances further endow the *Syedov's* drift with exceptional interest. First of all, it began while the North Pole Station was still continuing its observations.

Secondly, shortly after, several other ships, headed by the ice-breaker *Lenin,* also began a drift in the southwestern part of the Laptev Sea, ending on August 7, 1938 when the *Krassin* freed the caravan from the ice.

Comparisons of these drifts gave astonishing results. Differing in details, they nevertheless exhibited remarkable similarities, thus demonstrating that they were manifestations of the same causes—prevailing winds and continuous currents.

Thirdly, soon after the beginning of its drift, the *Syedov* found itself in the region where Nansen's *Fram* began its drift.

Comparisons between the drifts of the *Fram* and the *Syedov* are of exceptional interest because the former took place under climatic conditions markedly different from the present.

For a month the *Syedov* drifted northward; then, driven by west winds it reached its easternmost point at 78° 25′ latitude, 153° 26′ longitude, early in January, 1938. From then on it was carried slowly northwest. On February 18, 1939 the *Syedov* was at 85° 56.7′ latitude, 119° 59′ longitude, breaking the *Fram's* northering record. Turning southwest, for over two months, May 17-July 27—its route interwove with the *Fram's.* Then, turning northward again it established its own northering record on August 29—86° 39.5′ latitude, 47° 55′ longitude.

After that, dropping southward, it again crosses the *Fram* route, and then, taking a course between the Papanin and the *Fram* drifts, approaches the wide bay between Greenland and Spitzbergen. On December 1, 1939 the *Syedov* is drawn into the Greenland Sea ice drift. Moving southward at gradually increasing speed, the Syedov is at 81° 15.4′ latitude, 4° 16′ longitude, while the ice-breaker, the *Joseph Stalin,* is steaming to her rescue.

End of a Legend

In 1811 Yakov Sannikov, "sighted" land from the northern shore of Kotel Island. Trying to reach it on ice he found his way blocked by an expanse of unfrozen water.

From then on mysterious "Sannikov Land" has been a goal of arctic explorers and scientists. The *Fram* was the first ship to reach the region. During almost the entire winter of 1893-94 the *Fram* drifted beween 130° and 140° longitude and 79° to 81° latitude, but found no land. However, the *Fram* was not carried to the easternmost meridian of Kotel Island thus leaving the question of "Sannikov Land" open.

In 1900-1903 a Russian Polar expedition on the ship *Zarya,* and in 1913-1914 the ice-breakers *Taimyr* and *Yaigach,* attempted to find "Sannikov Land"; and in 1937 the *Sadko* made the search.

Though none of these expeditions found "Sannikov Land" they did not prove it non-existent.

During its drift the *Syedov* twice crossed the region of this supposed land—once from west to east, approximately along the 78th parallel and the second time from the southeast to the northwest, both times approximately in the latitudinal direction. The aerial expedition of Hero-of-the-Soviet-Union, Alexeyev, which removed part of the crews of the ice-breakers *Sadko, Syedov* and *Malygin,* crossed this region approximately in the meridional direction, his flights being made from the northern end of Kotel Island to the drifting caravan and under conditions of good visibility.

Finally the ice-breakers *Yermak* and *Stalin* passed through this region on their way to drifting ships, without coming upon "Sannikov Land."

These journeys, drifts and flights have conclusively exploded the 125 year legend of "Sannikov Land" which has given rise to an extensive literature.

Bounding the Arctic

Along with the explosion of the "Sannikov Land" myth, another geographical problem was solved by the *Syedov* drift. From the physico-geographic standpoint the Laptev Sea is merely a bay of the North Arctic Ocean. That is why the northern boundaries of the sea are problematical. They were arrived at by taking the arc of the great circle uniting Cape Molotov (northernmost promontory of Severnaya Zemlya) with the point of intersection of the meridian of the promontory of Kotel Island (139° longitude) and the edge of the banks of the mainland.

The map of the region lying to the north of the New Siberian Islands is now dotted with measurements. From these measurements, it appears likely that the continental banks on the meridian of Kotel Island (139° longitude) with depths not exceeding 200 meters (656 feet) ends at 78° 30′ latitude. At 79° 52′ latitude, 148° 02′ longitude the depth exceeded 3,000 meters (9,840 feet). One must assume that this is the north-easternmost point of the Laptev Sea.

From distribution of depths measured by the *Syedov,* it became clear that in the region of the New Siberian Islands the continental banks stretch further north than was supposed, while the continental declination turned out to be quite gradual, two degrees in width and with an incline not exceeding one degree.

Northward from Franz Josef Land, the Syedovites unexpectedly found great depths. Thus at 86° 26.6′ latitude and 39° 25′ longitude they did not reach bottom, after letting out more than 5,180 metres (17,290 feet) of sounding line.

The greatest depth measured by Nansen was 3,850 metres (11,628 feet); the greatest depth measured by the North Pole Station was 4,395 metres (14,416 feet). In the entire North Arctic Ocean there is only one point now known to be deeper than that found by the *Syedov.* This depth of 5,440 metres (17,843 feet) was an echo-sounding made by Sir Hubert Wilkins at 77° 46′ lat., and 175° long., which however Wilkins himself does not consider reliable.

Extremely interesting are the depths registered by the *Syedov* in the last stage of its drift—before entering the Greenland Sea. Nansen assumed that between the northeastern end of Greenland and the northwestern end of Spitzbergen there stretches what is now called the Nansen Submarine Threshold dividing the greatest depths of the Arctic Basin from the greatest depths of the Greenland Sea. Its eastern part was explored in 1935 by the *Sadko* expedition and its western by the North Pole Station. The *Syedov* crossed the Nansen Submarine Threshold at the center and noted a depth of 1,500 metres (4,920 feet), definitely fixing the presence of the threshold.

45 Years Later

Along with measurements of depth, the Syedovites conducted meteorological, hydrological, magnetic and gravimetric observations along the lines followed by the North Pole Station. The observations of the Syedovites confirmed reports of warm Atlantic waters in intermediate depths of the Arctic made by the Papaninite expedition and by Nansen.

It is interesting to note that the *Syedov* remained north of the 85th parallel twice as long as the North Pole Station and two and a half times longer than the *Fram* in spite of the latter's longer total drift, and that it began and ended considerably to the south of the *Fram;* thus its drift showed a greater speed.

The fact that the lines of drift of the *Syedov* and the *Fram* crossed each other at several points, made it possible to determine temperature changes in the Arctic Basin in the past 45 years.

On July 1, 1938, the *Syedov* was approximately at the same meridian at which the *Fram* was on January 1, 1894. However, on October 1, 1939 the *Syedov* was already at the meridian which the *Fram* reached only on February 1, 1896. Thus the distance west-

ward covered by the *Fram* in 25 months was covered by the *Syedov* in 15 months. The drift of the *Syedov* definitely confirmed the fact that during these years the flow of ice from the Arctic Basin into the Greenland Sea has considerably accelerated. This is accompanied by an increased flow into the Arctic of warm Atlantic waters, a reduction of the volume of ice in the bordering seas, a decrease in the thickness of polar ice, a retreat of the ice fields to the North, as well as the rise of winter temperatures, in the air above. All these phenomena are connected with the increasing warmth now to be observed in the Arctic, and which is not limited to the Arctic, but is a world-wide phenomenon.

In spite of the fact that the line of drift of the *Syedov* was considerably north of that of the *Fram,* Nansen recorded lower temperatures. The lowest air temperature recorded by the *Syedov* was 44.1° on March 10, 1939 at 86° 23′ lat., 110° 20′ long. The lowest temperature on the *Fram,* was—52° on January 15, 1896, at approximately 84° 55′ lat., 41° long, i.e., considerably further south and west of the place where the Syedovites registered their lowest temperature and where, as a rule, it is warmer.

The Syedovites devoted a great deal of attention to the observation of the polar ice and the snow crust. Every ten days they measured the thickness of the ice formed by natural freezing, that is, without packing and piling up of ice blocks. Thickness of the even ice, according to the Syedovites' measurements, did not exceed 218 centimetres (88 inches) as compared with 365 centimetres (146 inches) measured by Nansen.

Analysis indicated that this was due not so much to higher winter temperatures of the air, as to the greater recent extent of summer thaws.

The Belt of Piled Up Ice:

Since no ice thicker than 218 centimetres (88 inches) was encountered what was the origin and source of the three metre (nearly 10 feet) thick ice-floe of the Papaninites? Why did the *Syedov,* which on March 22, 1939, was 180 kilometres (110 miles) further north than the *Fram* position at the same meridian, later turn westward, failing to reach the 87th parallel?

The *Fram's* highest latitude was 85° 65.5′—the *Syedov's* 86° 39.5′. The northernmost point Nansen reached on another expedition was 86° 14′ latitude. In 1900 Kane reached latitude 86° 34′ in the same region. Both were stopped by piled up blocks of ice.

This data should be compared with the observations of Alexeyev during his flight between Franz Josef Land and the North Pole. He found that from Rudolf Island to 82° 31′ lat. there lie fields of piled up blocks of fresh ice, interspersed with icebergs. Beyond latitude 85° 30′ the dimensions of the ice fields increase to 20 kilometres (12 miles) in width, with smooth areas suitable for landing fields. At the 84th parallel, the thickness of the ice does not exceed 100-120 centimeters (40-48 inches). North of 85° 30′ are old icefields which, up to the 86th parallel were small, piled up in blocks, with fissures of thin ice. In such places it is impossible to land planes. Further north, especially between 87° and 88° 30′ the icefields present more favorable opportunities for landing.

From this description it is clear that between the North Pole and Franz Josef Land there exists a belt of piled up ice, dividing the fresher ice, mainly originating on the continental banks of the European-Asiatic mainland, from the stronger polar ice. This belt, which had halted Nansen and Kane, is a constant phenomenon.

Two Laws of Nansen:

Regularly, four times a day, the Syedovites broadcast their meteorological findings and position. In contrast to the meteorological observations of past polar explorers, the observations of the Syedovites (as of the Papaninites) were received by a network of Arctic meteorological stations.

A comparison of the drift of the ice with the wind which caused the drift, is of great interest. Analagous observations conducted near the shore are generally influenced by the adjoining land and shallow waters. Thus for theoretical examination we can only utilize the data gathered by the three drifts—the *Fram,* the ice-floe, North Pole Station (while in the central region of the Arctic Basin) and the *Syedov.*

Like all known drifts, the drift of the *Syedov* was not in a straight line. The ice-breaker not infrequently doubled back, made zigzags and even loops, in accordance with changes in the direction and velocity of the wind. The direction of the drift was 30° to 40° to the right of the direction of the wind.

The analysis of the *Syedov's* findings made by the author of this article shows that between September 1, 1938 and February 1, 1939 the continuous current had very little effect on the drift: for all practical purposes it may be considered absent. Far removed from the distorting influence of land and continuous currents, the drift caused by the wind here existed practically in its pure state, and could be studied under what amounted to laboratory conditions.

The findings verify the two simple laws of Nansen defining the behaviour of solid ice in the central region of the Arctic Basin:

First Law: in the absence of permanent ocean currents and far from the distorting influence of land and shallows, the ice fields of the Central Arctic drift at a speed one-fiftieth of the velocity of the wind.

Second Law: when the ice drifts under the influence of the wind, the direction of its drift is at an angle approximately 40 deg. to the right of the direction of the wind. This phenomenon is to be explained by the influence of the deflecting force of the rotation of the earth, which causes any moving body on its surface to tend to be deflected from its course, the deflection being to the right in the northern hemisphere, and to the left in the southern.

From the analysis of the drift the author was enabled to supplement Nansen's two laws with two more, equally simple:

First Law: the drift of the ice follows the isobars, that is, the lines joining points on the earth's surface where the atmospheric pressure is equal at one and the same time. The ice drifts along these lines in such a way that the region of high pressure is to the right of the direction of the drift, and the region of low pressure, to the left.

It is not difficult to deduce this law. As is generally known, winds blow from regions of high pressure to those of low pressure, and if the earth were stationary, their direction would be perpendicular to the isobars. The rotation of the earth, as well as friction against the latter's surface, deflects them, however, in the moderate and high latitudes considerably to the right, their actual direction being at an angle of about 30° to 40° to the left of the corresponding isobar. In accordance with Nansen's second law, the drift of the ice is, in turn, deflected from the direction of the wind at an angle of about 30° to 40° to the right. Hence we arrive at the fact that the ice drifts along the isobar.

The correctness of this law was verified over a number of sections of the *Syedov's* drift. A region of high pressure had its center over the Taimyr Peninsula during the first 10 days of December, 1938. Under the influence of west and southwest winds, the ice-breaker drifted along the isobar to the southeast, leaving the region of high pressure on its right. When, during the last 10 days of January, 1939, a region of low pressure prevailed over the Kara Sea and a region of high pressure was situated over the district of the Pole, the direction of the *Syedov's* drift was almost due west: in other words, also along the isobar.

Second Law: the ice drifts under the influence of winds at a speed that is proportional to the barometric gradient, that is, the difference in atmospheric pressure between two points on the earth's surface expressed as regards a given distance.

As follows from Nansen's first law, the ice moves, in the absence of permanent ocean currents and far from the distorting influence of land, at a speed proportional to the velocity of the wind. In its turn, the velocity of the wind is proportional to the barometric gradient; the closer the isobars are drawn on the chart of atmospheric pressure for any given region, the stronger the winds observed in that region. From this arose the possibility, backed by purely theoretical deductions, of arriving, not only at the direction of the drift of the ice, but also its speed, from barometric charts.

Comparison of Theoretical With Actual Drifts

Theoretical drifts of North Pole Station, the *Syedov* and the ice-breaker *Lenin,* which was caught in the ice in the southwestern part of the Laptev Sea in 1937, were plotted on a map on the basis of an analysis of the monthly barometric charts for the Arctic Basin. The general drifts of the station and the two vessels as they were in reality were then charted on the same map, the positions on the first of each month being taken as the standard.

The similarity between the lines of the theoretical drifts and those of the actual drifts was astonishing, most so in the case of the *Syedov,* which drifted, as we have noted in almost laboratory conditions. The theoretical drift of the *Lenin* also turned out to be quite close to the actual route, although it passed somewhat to the south and east. This is to be explained by the proximity of the mainland and the New Siberian Islands. The similarity in the theoretical and real drifts of the *Lenin* is particularly significant in that the path of the ship lay through the region of the Arctic best covered by meteorological stations and for which the barometric charts are drawn up on the basis of actual observations and not, as in the case of the central regions of the Arctic, of supposition.

A considerable discrepancy occurred between the direction of the theoretical and real drifts of the North Pole Station. At the same time, the actual drift turned out to be much faster than calculated.

Effect of East Greenland Current

Such a discrepancy is quite understandable. The ice in this region is not only influenced by meteorological forces, but also by a strong permanent current that carries the ice along the eastern coast of Greenland, the so-called East Greenland Current, arising from the inflow of surplus water from the Arctic, the wind system prevailing over that ocean, and the permanent north winds blowing along the east Greenland coast.

As observations have shown, the speed of the current flowing from the Pole toward the Greenland Sea is not very high, amounting to less than two kilometres (about a mile) a day, accelerating at the approaches, and in that sea itself. The North Pole Station ascertained that the speed of the current was four kilometres (two and a half miles) at about the 83rd parallel, six kilometres (three and three-fifth's miles) at about the 80th and nine kilometres (five and a half miles) at about the 75th.

It is only natural that local winds should exert paramount influence over the speed and direction of the drift of the ice fields in regions where permanent currents are weak. The drift becomes quite fantastic under their influence, the ice now moving forward, then backward and in circles.

In the Greenland Sea and its approaches the influence of local winds on the moving ice field diminishes. Winds contrary to the permanent current then only retard or temporarily delay the general drift to the south. Such was the case both with the North Pole Station and the *Syedov.*

This permanent ocean current was also partly responsible for the fact that the theoretical drift of the North Pole Station proved to be considerably shorter than was the case in reality. When a second theoretical drift was worked out for the station, provision being made for the permanent current, the direction and speed of which had been determined by Shirshov and Fyodorov, a striking coincidence with the actual drift was obtained. The resemblance was then even more marked than between the theoretical and real drifts of the *Syedov.*

Naturally, the method of working out theoretical drifts on the basis of the formulas for ascertaining the movement of the ice obtained as a result of the analysis of the *Syedov's* drift, will be given fuller and more concrete application after the publication of the complete observations of the North Pole Station and the *Syedov.* When the full data are available such a comparison will make it possible to deduce the speed and direction of the permanent currents, the presence of islands and shallows distorting the drifts, the distribution of pack and thin ice, and other facts.

New light has been shed on many and particularly on important phenomena in the Arctic. We are now in a position to study the changes in different parts of the ice pack covering the central Arctic.

If the ice fields are moved by the winds away from our shores, we are justified in expecting favorable navigation conditions along the Northern Sea Route, marked by an increased outflow into the polar basin of the local ice formed in the seas bordering on the Arctic. Conversely, with the approach of the polar ice to our coast, this movement of the local ice is suspended—in some cases there even being an influx of ice from the central basin into the border seas—and navigation conditions along the Northern Sea Route become worse.

The first laws of the movement of the ice under the influence of the wind supplementing Nansen's laws, have been corroborated by the drifts of the North Pole Station and the *Syedov.* They permit ordinary daily weather charts to be used for determining the ice drift.

This is one of the major achievements of the *Syedov's* drift. No doubt exists, moreover, that these achievements will be augmented when the observations of the *Syedov's* crew have been studied further.

(Adapted from articles by Prof. Zubov in Izvestia *of January 14 and in the* Moscow News.) SOVIET RUSSIA TODAY

Byrd-Ellsworth Findings Vital On Topography

But Polar Region Still Presents Problems in Geography and Geology

By John J. O'Neill
New York Herald Tribune

March 2

Antarctica, that most mysterious area, has finally yielded its chief secrets. It is now possible to fix the relationship of the South Polar continent to other land masses of the globe, and thanks largely to the explorations by Rear Admiral Richard E. Byrd and of Lincoln Ellsworth we know its principal topographical features.

Its place established with respect to its principal geographical features, Antarctica still presents some fascinating problems for the physical geographer, the geologist and the climatologist.

Antarctica belongs, in a geological sense, to the Pacific Basin. It completes the ring of mountainous areas that border the Pacific Ocean. Its mountains, and they are giants, extend in ranges that link the Andes of South America with the partly submerged continental masses of which New Zealand, Australia, the Malay Peninsula and the Japanese Archipelago are the principal elevated features.

Submarine Isthmus

The link to South America is not a straight line, but a submarine isthmus that swings out to the middle of the South Atlantic Ocean in a great loop. It starts in the archipelago that forms the tip end of South America, passes through the Falkland Islands that lie to the east, the South Georgia Islands that lie still farther east; turns south, passing through the Sandwich Islands that lie almost on the middle line of the Atlantic Ocean, and then swings back westward in a great arc that terminates in the peninsula on Antarctica known as Graham Land.

If this great loop were straightened out by moving Antarctica up toward Australia and elevated about 1,000 feet, the isthmus connection between South America and Antarctica would resemble the one which joins North and South America through Mexico and Central America. This submerged isthmus is an extension of the under-water continental shelf that surrounds the American continents and extends up to several hundred miles out into the oceans. A great deal of speculation will undoubtedly be built upon this great horizontal fold in the earth's crust. The first impression one gets from a chart of it is that Antarctica was once much farther away from South America and was moved to its present close position.

There are adequate grounds for building up such a hypothesis, which fits into the Wegener theory of the floating continents, offered to explain why the contours of the eastern coasts of the American continents look as though they would fit into those of the African and European continents. If South America moved westward a few thousand miles from contact with Africa, such a loop could be formed. There are many such coincidences in favor of the theory, but nothing resembling proof that any such movements took place.

Link to Australia

Another coincidence exists in the case of Antarctica, for on the opposite side of this continent is a submerged land bridge that links it with New Zealand and Australia. This is broader and lies much deeper in the ocean than the isthmus joining Antarctica to South America, but it makes a straighter connection between New Zealand and South Victoria Land, which lies directly below it on Antarctica.

These two links established by ocean soundings made by all explorers visiting Antarctic waters give external evidence of the relationship of Antarctica to the now complete mountain-studded ring surrounding the Pacific Ocean, but the present and recent explorations of Byrd and Ellsworth give internal evidence from the polar continent, in the distribution of its mountain ranges.

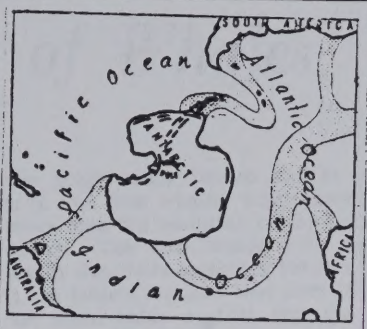
It is now evident that there are two principal mountain systems in Antarctica spreading in fanlike fashion westward from Graham Land and that these are a continuation of the Andean Cordillera in South America and the Rockies in North America. The longest is the southernmost branch that reaches straight across the polar continent, passing within a short distance of the pole and continuing in the highlands of South Victoria Land, where they point north to Australia. The northern branch is a coast range that borders the Pacific sector of the continent and includes the mountains discovered by Byrd during the last week, those he discovered a month ago, and the Edsel Ford and Rockefeller Mountains recorded during his previous visits. Both these ranges have their roots in the Eternity and Sentinel Mountains discovered by Ellsworth in the continental mass south of Graham Land.

Water Connection?

One of the problems that has been settled by the recent explorations is the question of whether a water connection exists between the two great water indentations that penetrate the continent from opposite sides, the Ross Sea on the Pacific side and the Weddell Sea on the Atlantic side. Byrd found some low land on the east side of Ross Sea that supported the theory of a connecting channel but he also found an extension of the Queen Maud Mountains to the east and another parallel range to the north lying across what would have been the channel region.

The two southern mountain ranges and a high plateau to the north of them with the Sentinel Mountains of Ellsworth to the north indicating a continuous ridge across the narrow portion of the continent definitely indicate that Antarctica is a continent and not an archipelago.

The two halves of Antarctica differ completely in their topography. The half on the Pacific Ocean side of the line joining the Ross and Weddell Seas is mountainous like the Rocky Mountain region of the United States and the half on the African and Indian Ocean side is as flat as Texas and more extensive than the whole Mississippi Valley area. It slopes upward gradually from the coast toward the South Pole, most of it at an altitude of more than 5,000 feet, and at the pole is a vast plateau 10,000 feet high. Except for a coast range of mountains, some of the peaks 13,000 feet high, in the Norwegian sector to the east of Weddell Sea, recently discovered on the Christiansen expedition, this half of the continent seems to be devoid of mountains. It has the appearance of being a great flat mass lifted to its present altitude instead of being raised in a mountain building process.



Undersea isthmus joining Antarctica to other continents

No continental shelf surrounds the plateau half of Antarctica. Its coast drops steeply into water thousands of feet deep. This is in strong contrast to the conditions in the coastal waters around the other mountainous half of the continent, where much of the ocean area is 500 feet deep or less. It is in this shallow area that the great loop to South America is situated. This loop does not stand alone as a submarine phenomenon, there being some less clearly defined parallel swirls of the same nature.

The Parallel Swirls

One of these submarine ridges extends up the middle of the Atlantic Ocean and joins the broad submarine plateau that extends out into the ocean toward Africa from South America. Another of these swirls associated with Graham Land indicates a less definite connection with the southerly tip of Africa. A great back-and-forth-turning movement of the Antarctic Continent while the mountain-building processes were under way might produce such long-looped swirls. It is an interesting coincidence that there are strong ocean currents in the direction of these loops.

Present observations indicate that the Antarctic Mountains are of the same age as the Andes and Rockies, which are the most recent of great mountain chains. There are, undoubtedly, volcanoes in Antarctica, since Byrd reports volcanic ash in icebergs, but none has yet been seen.

The ice now covering Antarctica came after the mountains were formed. At one time this polar continent was covered with rich vegetation. This is demonstrated by the existence of coal in the Queen Maud Mountains and indications that extensive beds are in other mountain regions. The ice came after the coal was formed. The ice was in some other part of the hemisphere when Antarctica was heavily forested, but where, no one knows—perhaps Australia or South America.

There is evidence that the South Polar ice cap is diminishing. Ellsworth reports islands on the Indian Ocean sector that appear to have been uncovered recently. The staff of the English expedition which sailed on the Discovery II found a submerged terminal moraine, indicating an ice sheet terminal, 100 miles to the north of the present edge of the ice shelf in Ross Sea. That this retreat of the ice is not uniform is indicated by the fact that in the fifteen years preceding 1933 the ice edge in Ross Sea advanced fourteen miles northward. There is similar evidence that Greenland's ice cap is receding. This could mean that the earth is getting warmer and both its ice caps are melting, or, as is more probable, that the earth's climate as a whole is being maintained in its present state and the ice caps are getting ready to shift elsewhere.

Much still remains to be done in Antarctic exploration, but the work done to date establishes the nature of the continent that is still to be explored.

INDIANS CAME HERE BEFORE CHRISTIAN ERA

Canadian Scientist Asserts They Were From Asia

WASHINGTON (Science Service) —While Europe's invasions and upheavals of population continue, scientists in America are striving to trace the mysterious invasions of America in Indian days.

Before the time of Christ, forefathers of every known division of Indians must have reached America via Bering Strait, is the conclusion advanced by Dr. Diamond Jenness, anthropologist of the National Museum of Canada. In a report published here by the Washington Academy of Sciences, Dr. Jenness pictures the arrival of Indian migration waves over 2,000 years ago, and tells what seems to have been the result.

Athapaskan-speaking tribes, destined to be forefathers of such groups as the Southwestern Navajo and Apache Indians, crossed from Asia into Alaska in the first millenium B. C. and forced their way southward, Dr. Jenness assumes. Two migration waves of these Asiatics may have occurred. And from the piece-meal evidence thus far available, it appears that the invaders drove some Eskimos eastward to become fugitives settling in the Eastern Arctic of America. The newcomers may also have dislodged some Algonkian tribes, starting them on a migration ending in the east, in Labrador.

The Athapaskan-speaking hordes introduced snowshoes into America and also perhaps brought bows and arrows to the Southwest.

So long as archaeologists find no trace of pottery along the Indian's ancient migration highway—that is, in Alaska, outside of the Eskimo area, nor in all north and west Canada—archaeologists will cling to the theory that pottery was invented in America by Indians quite independent of pottery in the Old World, says Dr. Jenness.

Efforts to link an Indian language with a language of the Old World have never been successful, Dr. Jenness declares. But he suspects that some day Eskimo speech may be joined up with Ural-Altaic languages of northern Eurasia. And Athapaskan tongues of North American Indians may turn out to be related to speech of the Chinese. Probably the diverse languages of the Indians and Eskimos were established mainly in Asia, before the hordes crossed into America, he says.

Horses Used in Arctic Region

Sturdy Yakut horses, which frequently live out of doors all winter in Siberia, are being used in the Arctic Circle.

Slaughter Threatens End of Whales

By Robert Cushman Murphy

New York Herald Tribune

DESPITE the publicity given to modern whaling, most Americans probably still think that the peak of slaughter on the high sea came at some time between the era of "Moby Dick" and the fading away of the Yankee fleet, toward the close of the nineteenth century. In 1846 736 American whaleships and 230 craft of other nations were cruising. New Bedford, the last stronghold, reached its top in 1857, when 329 vessels and 10,000 seamen called that city their home port.

It is possible that in the heyday of oldtime whaling as many as 12,000 great "fish," comprising sperm whales, right whales and humpbacks, may have fallen within a single calendar year to all the harpoons and hand lances in action. The oil produced in 1846 by American crews from twenty-seven ports, according to Starbuck's tables of the year 1878, totaled 302,918 barrels of thirty-one and one-half gallons. Taking into account the average yield of the species forming the prey, this might indicate a kill of approximately 7,500 whales by ships under our flag.

Such figures pale into insignificance when compared with those for the recent world catch, as issued by the Committee for International Whaling Statistics, appointed by the Norwegian government, and published annually at Oslo. The columns for 1937-'38 alone show a slaughter of 54,664 whales, the largest number ever killed; 46,039 of these were taken in Antarctic waters within a summer period extending from December into March, the remaining 8,625 during part or all of a twelve-month season in the Arctic, the North Pacific, the North Atlantic, along the African coast and off the shores of South America and Australia. The number of whales killed in all waters between the seasons of 1919 and 1938, inclusive, reaches the staggering total of 543,622. Details of oil production, in barrels of the modern fifty-gallon capacity, are available for a longer period; between 1909 and 1938 it summed up to 40,257,700 barrels.

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Such figures verge on the astronomical—or the numerical ideas associated with the current price of public administration! The stupendous quantities of flesh and blood now being taken from the sea by whaling operations can be grasped, perhaps, only by reference to the size of an individual whale. Eighty-two feet is about the average length of all the blue whales caught during the last decade. A carcass of the sort might weigh eighty tons, the equivalent of twenty male African elephants or of more than a thousand men. The human species, it must be remembered, represents in the world of today neither a small nor an average-sized animal, but a relatively huge one. There are, indeed, only a few hundred kinds of creatures of greater bulk than man himself, these comprising numerous other mammals, certain fishes and reptiles, a handful of flightless ostrich-like birds and a few invertebrates such as giant squids. But about a million and a half described species are so much smaller than man, in varying degree, that an average drawn from one full-grown example of each of the known kinds, whales included, would give us a product not very different in size from a housefly. The vital statistics tabulated in several hundred pages of the Norwegian reports referred to above were not compiled with the object of satisfying idle curiosity. Their inception lay in a deep-seated concern for waning resources needed by all nations and indispensable for the well-being of several. The original recommendation came from the International Council for the Study of the Sea, at a meeting held at London on April 10, 1929, which led in turn to the organizing of a central bureau by the Norwegian government and to the first publication, in 1930, of tables covering the preceding ten-year period. Subsequently the committee still further extended the record by compiling from all sources figures relating to modern steam-whaling from its beginning off the northern coast of Norway in 1868. The first thirty-five years of such whaling proved relatively picayune, the largest annual number of victims during the nineteenth century being 1,993 whales, taken in 1898. It was not until 1904, with the entry of steam-catchers into the Atlantic section of the Antarctic, that the kill began to mount into impressive figures.

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As a business proposition modern whaling has had its vagaries, a local falling off in the returns becoming apparent as soon as the size and perfection of equipment proved too formidable for the stock of whales to bear. The Newfoundland whale fishery, for example, began from shore stations in 1898, reached its peak in 1904 (1,276 whales), and fell away to five catching craft and a negligible return in 1913. Whaling from the Norwegian coast and from many other Northern Hemisphere stations has had a similar history, but the opening of the Antarctic grounds lent an enormous new impetus to the exploitation of wealth which, fallaciously, seemed "inexhaustible."

The first sign of unmistakable danger showed itself in a shift in the species of whales that made up the preponderant part of the catch at South Georgia, 1,200 miles east of Cape Horn. Originally more than 95 per cent of the whales captured were humpbacks, but as these became rapidly decimated the trend was progressively toward the finback and blue whales, which have lately been the mainstay of the industry. The blue whale, with a length sometimes exceeding 100 feet, is the largest creature that lives in the world today or that ever has lived. In the average summations of whalemen, with reference to derivation of oil, fertilizer and other products, one blue whale is taken to equal two finbacks, two and a half humpbacks, or six sei-whales.

The first restriction in pelagic whaling came in 1932, purely as a result of economic necessity. The whale oil market was glutted and Norway's great fleet remained in port. Only Japanese shore-whaling has shown a rather consistent balance, related to supply and demand at home rather than to the uncertainties of a world market. This is because the whales taken in Japan have always been used primarily as human food, for which reason each carcass can be made to realize a far higher return than that based principally upon the sale of oil. Between 1910 and 1932 Japanese domestic whale catchers have at no time been fewer than twenty nor more than thirty-five. Throughout this period the average number of whales taken annually by each boat has been fifty-five, or, roughly, one a week, as against a corresponding average of 188 for waters around South Georgia. These Japanese data, however, refer only to vessels working offshore from home ports. Between Nov. 1, 1937, and March 26, 1938, as well as during the two subsequent southern-summer seasons, Japan has carried on whaling in the Antarctic Ocean, with four floating factories and thirty catchers, entirely unimpeded by the limitations that other whaling nations have finally imposed upon themselves.

The first voluntary attempts to reduce the number of whales killed were influenced by the world financial crisis and realized by agreement between commercial companies. In this move labor had at least an equal share with capital, even to the point of threatening a general strike. The whale quota, that is, the absolute number of animals in "blue whale units" which each company was entitled to shoot, was mutually determined, in addition to which special efforts were made to assure the utmost possible recovery from each carcass. Cow whales seen to be accompanied by calves were granted immunity at all seasons. With very few exceptions, such regulations seem to have been scrupulously honored. Gradually all whaling concerns have entered the concordat, with the exception of the Japanese interests.

Notwithstanding these commendable attempts to repair a situation so palpably intolerable that it could end only in disaster, successive reports of the Committee on International Whaling Statistics during the 1930's developed a monotonous tone in reporting that the previous season's catch had again been "the largest ever recorded." In 1936 the governments of Great Britain and Norway pledged themselves to curtail the season everywhere south of 40 degrees south latitude to the short period between Dec. 8 and March 7, and still further to cut down the number of whale-catchers entitled to accompany each floating factory. During the same season, however, two Japanese expeditions and one German conducted their carnage without restrictions of any sort.

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Ultimately, in June, 1937, the situation attained full-fledged international status as regards the richest and last field, namely, all the free waters and national territories lying beyond latitude 40 degrees south. Stringent regulations for this great area, even to "game laws" covering a minimum legal size for whales of each species, were officially approved by the South African Union, Argentina, Australia, Germany, Great Britain, Ireland, Northern Ireland, New Zealand and the United States; only Japan, among the effective nations, still proved recalcitrant. Nevertheless, more than 11,000 men are now engaged in Antarctic whaling; the oil from Antarctic waters totaled during the latest season of record more than half a million tons, which fetched an average price of $65 a ton, or only 50 per cent of the lowest mean annual value for an earlier thirty-year term (1900-1929). The number of whales being slain is at least fourfold what the oceans can endure on a long-term basis, yet the goal of reasonable, and hence perpetual, utilization seems farther off than ever.

Robert Cushman Murphy

Canadian Post Office Holds Northern Record

OTTAWA — Craig Harbour, Northwest Territories, Canada, is the most northerly post office in the British Empire.